

1048

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**STOPPING  
WATER POLLUTION  
AT ITS SOURCE**



**MISA**

*Municipal/Industrial Strategy for Abatement*

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**ACUTE LETHALITY DATA FOR ONTARIO'S  
PETROLEUM REFINERY EFFLUENTS  
COVERING THE PERIOD FROM  
DECEMBER 1988 TO MAY 1989**

**JUNE 1990**

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Ontario

**Environment  
Environnement**

Jim Bradley, Minister/ministre

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MUNICIPAL/INDUSTRIAL STRATEGY FOR ABATEMENT  
(MISA)

ACUTE LETHALITY DATA FOR ONTARIO'S  
PETROLEUM REFINERY EFFLUENTS COVERING  
THE PERIOD FROM DECEMBER 1988 to MAY 1989

Report Prepared by:  
Aquatic Toxicity Unit  
Water Resources Branch  
Ontario Ministry of the Environment

JUNE 1990



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## SUMMARY

Ontario's Regulation under the Environmental Protection Act requires Petroleum Refineries to monitor their discharge (both process and cooling water) to receiving waters for acute lethality to trout and to *Daphnia magna*. The timing of these samples was arranged to coincide with chemical characterization also required under the regulation. The frequency of these samples is monthly for both toxicity test procedures on process effluents with the exception that if tests over three consecutive months show insignificant mortalities with trout then in subsequent months a single concentration test may be used. For cooling waters the required frequency of sampling is quarterly. In both cases the Ministry's test protocols were followed by all laboratories. All toxicity tests required by the regulation were submitted to the Ministry. The following data report presents the toxicity test results of this monitoring along with the results of audit samples that were tested at the Ministry's lab in Rexdale. In addition, toxicity tests on some intake waters were also submitted and these have been included in this report.

Of the more than 50 samples that were tested, only the process effluent at the Petro Canada refinery in Oakville had samples that caused significant mortalities. The sample from March 21, 1989 was toxic to both *Daphnia* and trout. This is explained best by the fact that samples taken on the same day measured more than 27 mg/l zinc. This is clearly above lethal levels. Other contributors to toxicity on this day may have been hexavalent chromium at 0.1 mg/l and unionized ammonia. The sample from April 11 was only toxic to *Daphnia*. At the Rexdale laboratory, toxicity tests with hexavalent chromium were performed and a LC50 value of 0.1 mg/l was determined for *Daphnia*. Since *Daphnia* tend to be slightly more sensitive to hexavalent chromium than trout, a value of 0.26 mg/l may have been lethal to one without being lethal to the other. The third lethal sample collected on December 13, 1989 was only lethal to trout. The toxicants in this sample cannot be determined with certainty. Neither zinc or chromium were measured on this sampling date. However, the ammonia concentration was close to lethal level and may have contributed to the observed lethality. Generally, trout are more sensitive to ammonia than are *Daphnia*.

It is clear that for these organisms, at least, samples from the Petroleum Refineries during this period had little effect on acute lethality.

The chemical characterization for the Petro-Canada refinery in Oakville was also reviewed in terms of other potential impacts. Eliminating the substances that had measured concentrations at or below detection limits, there is left a small list of organic compounds, which some are chlorinated. None of these appear to be present at acute lethal levels or even at chronic effect levels. However, a number of them can transfer to other media by volatilization or sorption to sediment therefore the potential for bioaccumulation should be reviewed.

Common to many of the samples from the Petro-Canada Oakville refinery are



measurable levels of some of the smaller Polycyclic Aromatic Hydrocarbons (PAHs). These chemicals are known to be transformed enzymatically by many aquatic organisms to varying degrees. Fish, for example, are more able to do this than are clams. Clams, therefore, tend to bioaccumulate higher concentrations of PAHs in their tissues. The ability of the organism to metabolize PAHs will not only reduce the amount of PAHs within itself but also reduce the availability for accumulation up the food chain. Although the levels of PAHs may be reduced, the remaining metabolites however can be highly genotoxic. Best known are the 4 and 5 ring PAHs like Benzo-a-pyrene but other PAHs have some of this effect.

Also present are measurable concentrations of two chlorinated hydrocarbons; chloromethane and 1,2 dichloropropane. These are highly volatile and would transfer to the air rapidly and not bioaccumulate. 1,2 Dichloropropane is fairly stable and may distribute through long range transport.

Some of the samples contain measurable amounts of benzene, toluene, xylene, and styrene. These single ring aromatics are generally highly volatile and may also be soluble in water.

There are also some chlorinated aromatics including 2,4,5 trichlorotoluene, 1,2,3,4 tetrachlorobenzene, and octachlorodibenzo-p-dioxin. They do not bioaccumulate but may have other toxic effects. Of the substances found, 2,4,5 trichlorotoluene and 1,2,3,4 tetrachlorobenzene represent the most potential hazard. The levels found, however, are considerably lower than known toxic levels. The dioxin found is the least toxic of the dioxins, having approximately 0.0001 times the toxicity of 2,3,7,8 TCDD. These substances may bioaccumulate and would be found primarily associated with particulates. The dioxin, while it has a high log Kow, it is also a large molecule and tends to be non-mobile in the environment.

Creosol, 2,4 dinitrophenol, 4 chloro 3 methyl phenol were found in measurable quantities. These are non-volatile and relatively soluble in water. Therefore their fate is determined primarily by dilution, dispersion, and reaction in the water. They would not be expected to bioaccumulate, but can be highly toxic.

In general, the reporting of toxicity data by the industries went smoothly. The quality of the toxicity results and presentation has been good. All problems have been minor ones which have now been resolved.

None of the audit samples caused significant mortalities to either species which was consistent with the results supplied by the industry. Unfortunately, it was not possible to have the audit samples collected at the same time as one of the industry reported samples. Other split samples with the same consultant labs have indicated that all labs involved are capable of producing comparable results.



COMPANY: Esso Petroleum Canada, Sarnia  
(70102)  
(now with Sarnia Refinery(Imperial Oil Ltd.))  
SECTOR: Petroleum Refining  
REGION: Southwest

#### SUMMARY

The data for six trout bioassays, conducted on process effluent samples collected between December 1988 and May 1989 were provided by Esso Petroleum Canada. All six process effluent samples were determined to have been non-acutely lethal to test fish.

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intake water

process effluent

05880001 sampled: 12/12/88 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890009 sampled: 01/23/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890010 sampled: 02/06/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890026 sampled: 03/06/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890028 sampled: 04/03/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890033 sampled: 05/01/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

01890105 sampled: 05/30/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA audit sample.

Esso Petroleum Canada (continued)

CW-SEP. 11&12

05890017 sampled: 02/14/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890043 sampled: 05/23/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

CW-Sep.9

05890016 sampled: 02/14/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890042 sampled: 05/23/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

CW-Sep.3

05890015 sampled: 02/14/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890041 sampled: 05/23/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

EO-Sep.14 outlet

EO-Sep.10

EO-Sep.5

EO-tank area-ditch

EO-filter-Sep.11&12

EO-Sep.14 inlet

EO-impounding basin

TOXICITY TEST REPORT Sample: 05880001

TEST CONDITIONS

Company : Esso Petroleum Canada  
(70102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : process effluent, (300)  
Laboratory : Pollutech  
Sampling Method : Water  
Sampled By : T. Moran  
Date Collected : 12/12/88  
Received : 12/12/88  
Tested : 12/13/88 at: 1130

Type of Bioassay : STATIC  
(protocol to determine the acute lethality  
of liquid effluents to fish, OME, 1985).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME							TOTAL MORTALITY	
%	00:00	02:10	03:10	05:25	22:10	46:10	70:00	95:00	%
100	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :

LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 05880001

TEST CONC.	ELAPSED TIME						
%	00:00	02:10	03:10	05:25	22:10	46:10	70:00 95:00
100	pH 7.0	7.4	7.4	7.4	7.4	7.5	7.4
	02 ppm 9.8	9.2	9.2	9.2	9.2	9.6	9.4
	Cond. 710	750					750
	Temp(C) 15.0	15.0	15.0	15.0	15.0	15.0	15.0
75	pH 7.0	7.5	7.5	7.5	7.5	7.6	7.5
	02 ppm 10.0	9.5	9.3	9.7	9.6		9.6
	Cond. 550	600					600
	Temp(C) 15.0	15.0	15.0	15.0	15.0	15.0	15.0
56	pH 7.1	7.5	7.6	7.6	7.6	7.6	7.6
	02 ppm 10.2	9.6	9.2	9.9	9.7		9.7
	Cond. 450	470					470
	Temp(C) 15.0	15.0	15.0	15.0	15.0	15.0	15.0
25	pH 7.0	7.5	7.5	7.6	7.6	7.6	7.6
	02 ppm 10.4	9.8	9.7	9.9	9.8		9.8
	Cond. 320	325					325
	Temp(C) 15.0	15.0	15.0	15.0	15.0	15.0	15.0
10	pH 7.0	7.5	7.6	7.6	7.6	7.6	7.6
	02 ppm 10.5	9.9	9.8	10.0	9.7		9.7
	Cond. 230	258					258
	Temp(C) 15.0	15.0	15.0	15.0	15.0	15.0	15.0
1	pH 7.0	7.6	7.6	7.6	7.6	7.7	7.7
	02 ppm 10.5	9.8	9.8	10.1	10.1		10.1
	Cond. 162	170					170
	Temp(C) 15.0	15.0	15.0	15.0	15.0	15.0	15.0
Control	pH 7.0	7.6	7.7	7.6	7.6	7.6	7.6
	02 ppm 10.2	10.0	10.0	10.1	10.2		10.2
	Cond. 162	168					168
	Temp(C) 15.0	15.0	15.0	15.0	15.0	15.0	15.0
Control	pH 7.1	7.6	7.6	7.6	7.6	7.6	7.6
	02 ppm 10.3	10.3	10.1	10.2	10.1		10.1
	Cond. 162	168					168
	Temp(C) 15.0	15.0	15.0	15.0	15.0	15.0	15.0

## MISA-PETROLEUM-FISH

## TOXICITY TEST REPORT Sample: 05890009

## TEST CONDITIONS

Company : Esso Petroleum Canada  
(70102)  
Region : Sarnia, ONT  
Industry : Southwest  
Control point : Petroleum Refining  
process effluent, (300)  
Laboratory : Pollutech  
Sampling Method : grab  
Sampled By : C. Ferguson  
Date Collected : 01/23/89  
Received : 01/23/89  
Tested : 01/24/89 at: 1700

## Type of Bioassay

: STATIC  
: Protocol to determine the acute lethality  
of liquid effluents to fish. OME, 1983).

Test Animal  
Weight(gm)  
Length(mm)

: Rainbow trout  
:  
:

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	17:00	42:00	65:30	93:30	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :  
LC50 Calculated By : none

## TOXICITY TEST PARAMETERS

Sample Number: 05890009

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 17:00 42:00 65:30 93:30

100	pH 02 ppm Cond. Temp(C)	7.1 8.0 15.0	7.4 9.8 15.0	7.4 10.0 15.0	7.4 9.8 15.0	7.4 9.0 850 15.0
75	pH 02 ppm Cond. Temp(C)	7.1 8.2 670 15.0	7.5 10.0 15.0	7.4 10.1 15.0	7.5 10.0 15.0	7.4 9.8 710 15.0
56	pH 02 ppm Cond. Temp(C)	7.1 9.0 470 15.0	7.6 10.2 15.0	7.5 10.1 15.0	7.5 10.2 15.0	7.4 9.6 468 15.0
25	pH 02 ppm Cond. Temp(C)	7.1 10.2 300 15.0	7.6 10.2 15.0	7.5 10.0 15.0	7.6 10.2 15.0	7.5 9.7 315 15.0
10	pH 02 ppm Cond. Temp(C)	7.2 10.0 220 15.0	7.6 10.0 15.0	7.4 9.8 15.0	7.6 10.0 15.0	7.5 9.8 285 15.0
1	pH 02 ppm Cond. Temp(C)	7.3 10.2 172 15.0	7.6 10.2 15.0	7.4 10.2 15.0	7.6 9.9 192 15.0	7.6 9.9 15.0
Control	pH 02 ppm Cond. Temp(C)	7.3 10.2 162 15.0	7.6 10.0 15.0	7.4 10.0 15.0	7.4 9.9 182 15.0	7.4 9.9 15.0
Control	pH 02 ppm Cond. Temp(C)	7.3 10.2 165 15.0	7.5 10.2 15.0	7.4 9.9 15.0	7.5 9.8 182 15.0	7.4 9.8 15.0

SLOPE of Mortality Curve :  
 LC50 Calculated By : none

## TOXICITY TEST REPORT Sample: 05890010

## TEST CONDITIONS

Company : Esso Petroleum Canada  
 : Sarnia, ONT  
 : (70102)  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : process effluent, (300)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : C. Ferguson  
 Date Collected : 02/06/89  
 Received : 02/06/89  
 Tested : 02/07/89 at: 1615

Type of Bioassay : STATIC  
 (Protocol to determine the acute lethality  
 of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	21:25	45:15	70:25	95:15	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
50	0	0	0	0	0	0
25	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Continued...

## TOXICITY TEST PARAMETERS

Sample Number: 05890010

TEST CONC.	E L A P S E D T I M E				
%	00:00	21:25	45:15	70:25	95:15
100	pH 6.8 O2 ppm 8.0 Cond. 980 Temp(C) 15.0	7.3 7.3 9.3 9.4 15.0 15.0	7.2 7.2 9.0 9.0 890 15.0	7.3 7.3 9.0 9.0 890 15.0	7.3 7.3 9.0 9.0 890 15.0
75	pH 7.0 O2 ppm 9.0 Cond. 680 Temp(C) 15.0	7.5 7.4 9.2 9.4 15.0 15.0	7.2 7.2 8.8 8.8 680 15.0	7.3 7.3 9.0 9.0 680 15.0	7.3 7.3 9.0 9.0 680 15.0
50	pH 7.1 O2 ppm 9.6 Cond. 535 Temp(C) 15.0	7.5 7.3 9.2 9.2 15.0 15.0	7.3 7.3 9.1 9.1 550 15.0	7.4 7.4 9.2 9.2 550 15.0	7.4 7.4 9.2 9.2 550 15.0
25	pH 7.3 O2 ppm 10.4 Cond. 320 Temp(C) 15.0	7.7 7.5 9.5 8.4 15.0 15.0	7.5 7.5 9.3 9.3 325 15.0	7.5 7.5 9.4 9.4 325 15.0	7.5 7.5 9.4 9.4 325 15.0
10	pH 7.4 O2 ppm 10.8 Cond. 235 Temp(C) 15.0	7.8 7.5 9.7 9.6 15.0 15.0	7.5 7.5 9.4 9.4 232 15.0	7.6 7.6 9.2 9.2 232 15.0	7.6 7.6 9.2 9.2 232 15.0
1	pH 7.4 O2 ppm 11.0 Cond. 170 Temp(C) 15.0	7.9 7.5 9.7 9.8 15.0 15.0	7.5 7.5 9.6 9.6 190 15.0	7.7 7.7 9.5 9.5 190 15.0	7.7 7.7 9.5 9.5 190 15.0
Control	pH 7.3 O2 ppm 10.8 Cond. 162 Temp(C) 15.0	7.7 7.5 9.8 9.9 15.0 15.0	7.6 7.6 9.7 10.0 172 15.0	7.6 7.6 9.7 9.7 172 15.0	7.6 7.6 9.7 9.7 172 15.0
Control	pH 7.3 O2 ppm 11.0 Cond. 162 Temp(C) 15.0	7.6 7.4 9.8 9.8 15.0 15.0	7.5 7.5 9.9 9.9 15.0 15.0	7.5 7.5 9.9 9.9 15.0 15.0	7.5 7.5 9.9 9.9 15.0 15.0

## MUSA-PETROLEUM FISH

SLOPE of Mortality Curve : none  
LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 05890026

## TEST CONDITIONS

Company : Esso Petroleum Canada  
Sarnia, ONI  
(70102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : process effluent, (300)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : C. Ferguson  
Date Collected : 03/06/89  
Received : 03/06/89  
Tested : 03/07/89 at: 1530

Type of Bioassay :

: STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish, OME, 1983).

Test Animal  
Weight(gm)  
Length(mm)

: Rainbow trout  
:  
:

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	20:00	49:10	68:00	94:10	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-Lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890026

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 20:00 49:10 68:00 94:10

100	pH	7.0	7.5	7.4	7.4
	O2 ppm	7.8	9.0	9.5	10.0
	Cond.	600			680
	Temp(C)	15.0	15.0	15.0	15.0
100	pH	7.0	7.4	7.5	7.5
	O2 ppm	7.6	9.2	9.6	10.0
	Cond.	600			690
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.6	7.5	7.6	7.5
	O2 ppm	10.0	9.8	10.1	10.2
	Cond.	168			178
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.6	7.5	7.6	7.7
	O2 ppm	9.9	9.6	9.8	10.2
	Cond.	178			178
	Temp(C)	15.0	15.0	15.0	15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890028

## TEST CONDITIONS

Company : Esso Petroleum Canada  
Region : Sarnia, ONT  
Industry : (70102)  
Southwest  
Petroleum Refining  
Control point : process effluent, (300)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : C. Ferguson  
Date Collected : 04/03/89  
Received : 04/03/89  
Tested : 04/04/89 at: 1330

## Type of Bioassay

: STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. OME, 1983).

Test Animal  
Weight(gm)  
Length(mm)

: Rainbow trout  
:  
:

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY
%	00:00	19:15	46:10	69:00	95:10		%
100	0	0	0	0	0		0
100	0	0	0	0	0		0
Control	0	0	0	0	0		0
Control	0	0	0	0	0		0

% Hour LC50

: Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890028

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 19:15 46:10 69:00 95:10

100	pH	6.9	7.3	7.3	7.3	7.4
	O2 ppm	7.4	8.2	9.0	9.2	9.2
	Cond.	550				550
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	6.9	7.3	7.3	7.4	7.4
	O2 ppm	7.6	9.0	9.2	9.3	9.2
	Cond.	550				550
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.3	7.6	7.3	7.5
	O2 ppm	10.2	9.2	10.1	9.9	10.0
	Cond.	162				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.4	7.6	7.4	7.5
	O2 ppm	10.2	9.2	10.2	10.0	10.0
	Cond.	162				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890033

TEST CONDITIONS

Company : Esso Petroleum Canada  
Sarnia, ONT  
(70102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : process effluent, (300)  
Laboratory : Pollutech  
Sampling Method : grab  
Sampled By : C. Ferguson  
Date Collected : 05/01/89  
Received : 05/01/89  
Tested : 05/02/89 at: 1400

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY
%	00:00	21:30	47:30	72:30	97:30	%	
100	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890033

TEST CONC. %	E L A P S E D T I M E					
	00:00	21:30	47:30	72:30	97:30	
100	pH 7.8 Cond. 660 Temp(C) 15.0	6.8 7.8 660 15.0	7.5 9.8 15.0	7.4 8.6 15.0	7.4 9.0 15.0	7.2 9.6 650 15.0
100	pH 7.6 Cond. 660 Temp(C) 15.0	6.8 7.6 660 15.0	7.5 9.6 15.0	7.4 8.6 15.0	7.4 9.0 15.0	7.2 9.5 650 15.0
Control	pH 10.6 Cond. 158 Temp(C) 15.0	7.3 10.6 158 15.0	7.6 9.8 15.0	7.6 9.3 15.0	7.3 9.8 15.0	7.3 10.1 172 15.0
Control	pH 10.4 Cond. 158 Temp(C) 15.0	7.3 10.4 158 15.0	7.6 10.0 15.0	7.6 9.4 15.0	7.5 9.9 15.0	7.3 10.0 170 15.0

## TOXICITY TEST REPORT

## TOXICITY TEST PARAMETERS

## TEST CONDITIONS

Company : Esso Petroleum Canada  
Sarnia, ONT  
(70102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : process effluent, (300)  
Laboratory : MDC  
Sampling Method : grab  
Sampled By : D. Hamilton  
Date Collected : 05/30/89  
Received : 05/30/89  
Tested : 05/31/89 at: 930

## Type of Bioassay

: STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish, OME, 1983).

Test Animal  
Weight(gm)  
Length(mm)

: Rainbow trout  
:  
:

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E							TOTAL MORTALITY
%	00:00	02:10	24:00	48:10	75:30	98:10		%
100	0	0	0	0	0	0		0
65	0	0	0	0	0	0		0
40	0	0	0	0	0	0		0
30	0	0	0	0	0	0		0
20	0	0	0	0	0	0		0
10	0	0	0	0	0	0		0
Control	0	0	0	0	0	0		0

96 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments : MISA supply sample.

Sample Number: 01890105

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 02:10 24:00 48:10 75:30 98:10

100	pH 02 ppm Cond. Temp(C)	7.0 8.7 510 14.0	7.3 10.2 510 14.0	7.6 9.6 540 15.0	7.5 8.6 560 15.0	7.3 9.6 540 15.0	7.2 9.5 525 15.0
65	pH 02 ppm Cond. Temp(C)	7.6 10.0 445 14.0	7.6 9.6 450 15.0	7.6 9.7 460 15.0	7.6 9.7 460 15.0	7.2 9.4 460 15.0	7.2 9.4 460 15.0
40	pH 02 ppm Cond. Temp(C)	7.5 10.0 374 14.0	7.7 9.7 375 15.0	7.6 9.7 390 15.0	7.6 9.7 390 15.0	6.8 9.7 350 15.0	7.3 9.4 350 15.0
30	pH 02 ppm Cond. Temp(C)	7.5 9.9 335 14.0	7.6 9.7 345 15.0	7.6 9.7 345 15.0	7.6 9.7 345 15.0	8.1 9.7 330 15.0	7.3 9.5 340 15.0
20	pH 02 ppm Cond. Temp(C)	7.4 9.8 315 14.0	7.7 9.6 315 15.0	7.5 9.7 320 15.0	7.5 9.8 320 15.0	8.1 9.8 320 15.0	7.3 9.4 280 15.0
10	pH 02 ppm Cond. Temp(C)	7.4 9.7 285 14.0	7.6 9.6 280 15.0	7.5 9.6 285 15.0	7.5 9.6 280 15.0	8.1 9.9 280 15.0	7.3 9.4 275 15.0
Control	pH 02 ppm Cond. Temp(C)	7.7 9.7 260 14.0	7.4 9.8 260 15.0	7.1 9.8 260 15.0	7.4 9.8 260 15.0	8.1 9.7 260 15.0	7.3 9.5 260 15.0

## MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890017

## TEST CONDITIONS

Company : Esso Petroleum Canada  
Sarnia, ONT  
Region : Southwest  
Industry : Petroleum Refining  
Control point : CW-SEP. 11&12, (400)  
Laboratory : PolLutech  
Sampling Method : grab  
Sample Collected : 02/14/89  
Date Received : 02/14/89  
Tested : 02/15/89 at: 1315

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish, OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	%	00:00	21:25	46:25	72:30	95:15	TOTAL MORTALITY %
100	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve : none  
LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 05890017

TEST CONC. %	ELAPSED TIME	00:00	21:25	46:25	72:30	95:15
100	pH	7.9	7.6	7.6	7.6	7.6
	O2 ppm	8.4	9.4	9.4	9.8	9.7
	Cond.	188				190
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.8	7.6	7.6	7.6	7.6
	O2 ppm	9.0	9.8	9.3	9.8	9.8
	Cond.	184				188
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.7	7.7	7.6	7.6	7.7
	O2 ppm	9.2	9.6	9.7	9.8	9.8
	Cond.	182				185
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.6	7.6	7.6	7.5	7.6
	O2 ppm	9.4	9.4	9.3	9.6	10.0
	Cond.	178				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.6	7.6	7.6	7.6	7.6
	O2 ppm	9.6	9.6	9.8	9.8	10.1
	Cond.	176				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.6	7.5	7.6	7.6	7.6
	O2 ppm	9.6	9.6	9.8	10.0	10.0
	Cond.	174				180
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.4	7.7	7.6	7.6	7.7
	O2 ppm	10.4	9.9	10.6	10.2	10.2
	Cond.	176				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.4	7.6	7.5	7.6	7.7
	O2 ppm	10.6	9.9	10.3	10.1	10.3
	Cond.	174				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0

## TOXICITY TEST REPORT      Sample: 05890043

## TEST CONDITIONS

Company : Esso Petroleum Canada  
Sarnia, ONT  
(70102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : CW-SEP. 11&12, (400)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : C. Ferguson  
Date Collected : 02/23/89  
Received : 05/24/89 at: 1230  
Tested :

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish, ONE, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D   T I M E					TOTAL MORTALITY
%	00:00	24:00	52:10	75:10	97:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
50	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

56 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890043

TEST CONC. %      E L A P S E D   T I M E  
00:00 24:00 52:10 75:10 97:10

100	pH 02 ppm Cond. Temp(C)	8.2 9.0 178 15.0	7.5 9.4 15.0	7.5 8.4 15.0	7.4 9.3 15.0	7.5 9.7 187 15.0
75	pH 02 ppm Cond. Temp(C)	7.8 9.2 176 15.0	7.5 9.5 15.0	7.5 8.5 15.0	7.4 9.6 15.0	7.5 9.7 182 15.0
50	pH 02 ppm Cond. Temp(C)	7.5 9.5 174 15.0	7.4 9.5 15.0	7.5 9.5 15.0	7.4 9.2 15.0	7.5 9.6 179 15.0
25	pH 02 ppm Cond. Temp(C)	7.3 9.7 172 15.0	7.3 9.5 15.0	7.4 8.6 15.0	7.3 9.2 15.0	7.4 9.1 185 15.0
10	pH 02 ppm Cond. Temp(C)	7.2 9.9 170 15.0	7.3 9.1 15.0	7.4 8.4 15.0	7.3 8.6 15.0	7.4 9.1 175 15.0
1	pH 02 ppm Cond. Temp(C)	7.2 9.9 170 15.0	7.3 9.3 15.0	7.5 8.4 15.0	7.3 8.7 15.0	7.4 9.2 173 15.0
Control	pH 02 ppm Cond. Temp(C)	7.0 9.9 172 15.0	7.4 9.7 15.0	7.4 8.4 15.0	7.3 9.8 15.0	7.4 9.6 178 15.0
Control	pH 02 ppm Cond. Temp(C)	7.0 9.8 174 15.0	7.3 9.5 15.0	7.3 8.6 15.0	7.3 9.0 15.0	7.3 9.6 178 15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none  
 LC50 Calculated By :

Sample: 05890016

TOXICITY TEST REPORT

## TEST CONDITIONS

Company : Esso Petroleum Canada  
 : Sarnia, ONT  
 : (70102)  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : CW-Sep. 9, (500)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : C. Ferguson  
 Date Collected : 02/14/89  
 Received : 02/14/89  
 Tested : 02/15/89 at: 1315

Type of Bioassay : STATIC  
 (protocol to determine the acute lethality  
 of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	21:25	51:25	72:30	95:15	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal  
 95% fid. limits : 0.0 - 0.0 %  
 Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890016

TEST CONC. %	E L A P S E D T I M E				
	00:00	21:25	51:25	72:30	95:15
100	pH 02 ppm Cond. Temp(C)	7.8 8.0 720 15.0	7.5 10.0 15.0	7.6 9.6 15.0	7.6 9.7 10.0 15.0
75	pH 02 ppm Cond. Temp(C)	7.7 8.1 560 15.0	7.6 9.8 15.0	7.6 9.4 15.0	7.7 9.6 10.0 15.0
56	pH 02 ppm Cond. Temp(C)	7.6 8.2 460 15.0	7.5 9.6 15.0	7.4 9.6 15.0	7.7 9.6 458 15.0
25	pH 02 ppm Cond. Temp(C)	7.5 9.4 320 15.0	7.5 9.9 15.0	7.6 9.4 15.0	7.6 9.6 310 15.0
10	pH 02 ppm Cond. Temp(C)	7.5 9.4 220 15.0	7.5 9.9 15.0	7.5 9.6 15.0	7.6 9.8 225 15.0
1	pH 02 ppm Cond. Temp(C)	7.5 9.4 180 15.0	7.5 9.6 15.0	7.6 9.7 15.0	7.6 10.1 195 15.0
Control	pH 02 ppm Cond. Temp(C)	7.4 10.6 174 15.0	7.7 9.9 15.0	7.6 10.6 15.0	7.7 10.2 178 15.0
Control	pH 02 ppm Cond. Temp(C)	7.4 10.6 174 15.0	7.6 9.6 15.0	7.5 10.3 15.0	7.7 10.1 178 15.0

Sample: 05890042

## TOXICITY TEST REPORT

## TEST CONDITIONS

Company : Esso Petroleum Canada  
Sarnia, ONT  
(70102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : CW-Sep.9, (500)  
Laboratory : Pollutech  
Method : Grab  
Sampled By : C.Ferguson  
Date Collected : 05/23/89  
Received : 05/23/89  
Tested : 05/24/89 at: 1230

## Type of Bioassay

: STATIC (Protocol to determine the acute lethality  
of liquid effluents to fish. OME, 1983).

Test Animal:  
Weight(gm)  
Length(mm)

: Rainbow trout

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	52:10	75:10	97:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890042

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 52:10 75:10 97:10

100	pH	7.8	7.4	7.4	7.3	7.3
	O2 ppm	9.6	9.4	8.7	9.1	9.3
	Cond.	620				650
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.5	7.3	7.4	7.3	7.3
	O2 ppm	9.4	9.2	8.5	9.1	9.3
	Cond.	520				530
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.3	7.3	7.3	7.2	7.3
	O2 ppm	9.5	9.5	8.2	9.4	9.4
	Cond.	410				410
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.2	7.2	7.3	7.3	7.4
	O2 ppm	9.5	9.6	8.3	9.0	9.4
	Cond.	292				295
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.2	7.3	7.3	7.2	7.4
	O2 ppm	9.2	9.4	8.4	9.1	9.2
	Cond.	210				210
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.2	7.2	7.3	7.3	7.4
	O2 ppm	9.8	9.5	8.4	8.5	8.8
	Cond.	180				179
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.4	7.4	7.3	7.4
	O2 ppm	9.9	9.7	8.4	9.8	9.6
	Cond.	172				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.3	7.3	7.3	7.3
	O2 ppm	9.8	9.5	8.6	9.0	9.6
	Cond.	174				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0

## MISA-PETROLEUM-FISH

## TOXICITY TEST REPORT Sample: 05890015

## TEST CONDITIONS

Company : Esso Petroleum Canada  
 : Sarnia, ONT  
 : (70102)  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : CW-Sep.3, (600)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : C. Ferguson  
 Date Collected : 02/14/89  
 Received : 02/14/89  
 Tested : 02/15/89 at: 1315

## Type of Bioassay

: STATIC  
 (Protocol to determine the acute lethality  
 of liquid effluents to fish, OME, 1983).

Test Animal : Rainbow trout  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	21:25	51:25	72:30	95:25	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
50	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	1	10
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve : none  
 LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 05890015

TEST CONC. %  
 ELAPSED TIME  
 00:00 21:25 51:25 72:30 95:25

100	pH 02 ppm Cond. Temp(C)	7.7 8.2 174 15.0	7.7 9.9 15.0	7.7 9.6 15.0	7.6 9.9 15.0	7.6 10.2 178 15.0
75	pH 02 ppm Cond. Temp(C)	7.6 8.2 174 15.0	7.5 9.6 15.0	7.6 9.6 15.0	7.5 9.6 15.0	7.5 9.8 178 15.0
56	pH 02 ppm Cond. Temp(C)	7.6 8.2 172 15.0	7.6 9.6 15.0	7.6 9.9 15.0	7.6 9.8 178 15.0	7.6 9.9 178 15.0
25	pH 02 ppm Cond. Temp(C)	7.6 8.2 174 15.0	7.6 9.7 15.0	7.6 9.7 15.0	7.6 9.9 15.0	7.6 10.0 179 15.0
10	pH 02 ppm Cond. Temp(C)	7.6 8.1 176 15.0	7.6 9.8 15.0	7.6 9.8 15.0	7.6 10.1 179 15.0	7.6 10.1 179 15.0
1	pH 02 ppm Cond. Temp(C)	7.5 8.2 176 15.0	7.5 9.9 15.0	7.6 9.9 15.0	7.6 10.0 15.0	7.5 9.8 180 15.0
Control	pH 02 ppm Cond. Temp(C)	7.4 10.6 174 15.0	7.7 9.9 15.0	7.6 10.6 15.0	7.6 10.2 15.0	7.7 10.2 178 15.0
Control	pH 02 ppm Cond. Temp(C)	7.4 10.6 174 15.0	7.6 9.6 15.0	7.5 10.3 15.0	7.6 10.1 15.0	7.7 10.3 178 15.0

## TOXICITY TEST REPORT      Sample: 05890041

TEST CONDITIONS

Company : Esso Petroleum Canada  
Sarnia, ONT  
(70102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : CW-Sep.3, (600)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : C. Ferguson  
Date Collected : 05/23/89  
Received : 05/23/89  
Tested : 05/24/89 at: 1230

Type of Bioassay

: STATIC  
: Protocol to determine the acute lethality  
of liquid effluents to fish, ONE, 1983).

Test Animal  
Weight(gm)  
Length(cm)

: Rainbow trout  
:  
:

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	49:00	75:10	97:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

% Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890041

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	49:00	75:10	97:10
100	pH 7.7 O2 ppm 9.7 Cond. 170 Temp(C) 15.0	7.4 9.9 15.0	7.3 8.7 15.0	7.3 9.1 15.0	7.3 9.8 172 15.0
75	pH 7.4 O2 ppm 9.8 Cond. 170 Temp(C) 15.0	7.3 9.9 15.0	7.4 8.6 15.0	7.2 8.8 15.0	7.3 9.1 172 15.0
56	pH 7.2 O2 ppm 9.7 Cond. 172 Temp(C) 15.0	7.2 9.7 15.0	7.4 8.4 15.0	7.2 8.7 15.0	7.3 9.1 175 15.0
25	pH 7.1 O2 ppm 9.8 Cond. 172 Temp(C) 15.0	7.1 9.8 15.0	7.3 8.2 15.0	7.2 8.6 15.0	7.3 8.8 175 15.0
10	pH 7.1 O2 ppm 9.8 Cond. 174 Temp(C) 15.0	7.1 9.8 15.0	7.3 8.4 15.0	7.2 9.2 15.0	7.3 9.2 178 15.0
1	pH 7.1 O2 ppm 9.8 Cond. 174 Temp(C) 15.0	7.1 9.8 15.0	7.4 8.4 15.0	7.3 9.1 15.0	7.3 9.0 180 15.0
Control	pH 7.0 O2 ppm 9.9 Cond. 172 Temp(C) 15.0	7.0 9.9 15.0	7.4 9.7 15.0	7.3 9.8 15.0	7.4 9.6 178 15.0
Control	pH 7.0 O2 ppm 9.8 Cond. 174 Temp(C) 15.0	7.0 9.8 15.0	7.3 9.5 15.0	7.3 8.6 15.0	7.3 9.0 178 15.0



COMPANY: Esso Petroleum Canada, Sarnia  
(70102)  
(now with Sarnia Refinery(Imperial Oil Ltd.))  
SECTOR: Petroleum Refining  
REGION: Southwest

#### SUMMARY

Data for six *Daphnia magna* acute lethality toxicity tests conducted on samples of Process Effluent collected between December 1988 and May 1989 were provided by Esso Petroleum Canada in Sarnia. All six of these samples were determined to be not acutely lethal to *Daphnia*.

Toxicity tests were also conducted on two samples from each of CW.-Sep 3, CW.-Sep 9, and CW.-Sep 11&12 sampling points. All six samples were not acutely lethal to *Daphnia magna*.

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intake water

process effluent

05880001 sampled: 12/12/88 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890009 sampled: 01/23/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890010 sampled: 02/06/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890026 sampled: 03/06/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890028 sampled: 04/03/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890033 sampled: 05/01/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

02890105 sampled: 05/30/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA Audit

Esso Petroleum Canada (continued)

CW-SEP. 11&12

05890017 sampled: 02/14/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890043 sampled: 05/23/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

CW-Sep.9

05890016 sampled: 02/14/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890042 sampled: 05/23/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

CW-Sep.3

05890015 sampled: 02/14/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890041 sampled: 05/23/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

EO-Sep.14 outlet

EO-Sep.10

EO-Sep.5

EO-tank area-ditch

EO-filter-Sep.11&12

EO-Sep.14 inlet

EO-impounding basin

TOXICITY TEST REPORT Sample: 05880001

TEST CONDITIONS

Company : Esso Petroleum Canada  
 Location : Sarnia, ONT  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : process effluent, (300)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : T. Moran  
 Date Collected : 12/12/88  
 Date Received : 12/12/88  
 Tested : 12/13/88 at: 1100

Type of Bioassay : STATIC  
 (Daphnia magna Acute Lethality Toxicity  
 Test Protocol, OME, 1988)

Test Animal : D. magna  
 Weight(gm) :  
 Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY %
100	0	00:00 47:00	0
50	0		0
26	0		8
13	0		0
6	0		0
Control	0		0

48 Hour LC50 : Non-lethal  
 95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :  
 LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 05880001

TEST CONC. %  
 ELAPSED TIME  
 00:00 47:00

100	pH 7.1 7.3 O2 ppm 8.0 8.8 Cond. 800 800 Temp(C) 20.0 20.0
50	pH 7.6 7.5 O2 ppm 8.7 9.1 Cond. 700 700 Temp(C) 20.0 20.0
26	pH 7.9 7.9 O2 ppm 8.9 9.3 Cond. 600 650 Temp(C) 20.0 20.0
13	pH 8.0 8.0 O2 ppm 9.1 9.4 Cond. 620 625 Temp(C) 20.0 20.0
6	pH 8.0 8.0 O2 ppm 9.2 9.4 Cond. 600 600 Temp(C) 20.0 20.0
Control	pH 8.1 8.0 O2 ppm 9.3 9.4 Cond. 600 600 Temp(C) 20.0 20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
LC50 Calculated By :

Sample: 05890009

## TOXICITY TEST REPORT

## TOXICITY TEST PARAMETERS

## TEST CONDITIONS

Company : Esso Petroleum Canada  
Sarnia, ONT  
(70102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : process effluent, (300)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : T. Moran  
Date Collected : 01/23/89  
Received : 01/23/89  
Tested : 01/24/89 at: 930

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, OME, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 51:00	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

Sample Number: 05890009

TEST ELAPSED TIME  
CONC. %  
00:00 51:00

100	pH 7.2 O2 ppm 8.7 Cond. 8.4 Temp(C) 1000 20.0	20.0
50	pH 7.6 O2 ppm 9.0 Cond. 8.2 Temp(C) 800 20.0	20.0
26	pH 7.8 O2 ppm 9.2 Cond. 8.4 Temp(C) 700 20.0	20.0
13	pH 8.0 O2 ppm 9.2 Cond. 8.6 Temp(C) 650 20.0	20.0
6	pH 8.0 O2 ppm 9.3 Cond. 8.4 Temp(C) 650 20.0	20.0
Control	pH 8.0 O2 ppm 9.3 Cond. 8.4 Temp(C) 580 20.0	20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 05890010

## TEST CONDITIONS

Company : Esso Petroleum Canada  
Sarnia, ONT  
(70102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : process effluent, (300)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : C. Ferguson  
Date Collected : 02/06/89  
Received : 02/06/89  
Tested : 02/06/89 at: 1735

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, OME, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	%	E L A P S E D T I M E	TOTAL MORTALITY
100	0	00:00 47:35	0
50	0		0
26	0		0
13	0		0
6	0		0
Control	0		0

48 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890010

TEST  
CONC.  
%

E L A P S E D  
T I M E

00:00 47:35

100	pH 7.0 02 ppm 6.2 Cond. 920 Temp(C) 820 20.0	7.3 7.4 820 20.0
50	pH 7.4 02 ppm 7.6 Cond. 740 Temp(C) 740 20.0	7.7 7.4 740 20.0
26	pH 7.6 02 ppm 8.0 Cond. 660 Temp(C) 700 20.0	7.9 7.8 700 20.0
13	pH 8.0 02 ppm 8.2 Cond. 620 Temp(C) 640 20.0	8.0 8.0 7.9 640 20.0
6	pH 8.0 02 ppm 8.6 Cond. 600 Temp(C) 620 20.0	8.0 8.0 8.4 620 20.0
Control	pH 8.0 02 ppm 8.6 Cond. 540 Temp(C) 620 20.0	8.1 8.4 540 620 20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890026

TEST CONDITIONS

Company : Esso Petroleum Canada  
Sarnia, ONT  
(70102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : process effluent, (300)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : C. Ferguson  
Date Collected : 03/06/89  
Received : 03/06/89  
Tested : 03/07/89 at: 1400

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, OME, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 47:30	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890026

TEST CONC. %  
ELAPSED TIME  
00:00 47:30

100	pH 6.9 7.4 O2 ppm 9.0 8.6 Cond. 690 680 Temp(C) 20.0 20.0
50	pH 7.5 7.8 O2 ppm 9.1 8.6 Cond. 630 650 Temp(C) 20.0 20.0
26	pH 7.8 7.9 O2 ppm 9.0 8.9 Cond. 610 620 Temp(C) 20.0 20.0
13	pH 8.0 8.0 O2 ppm 9.0 9.2 Cond. 600 610 Temp(C) 20.0 20.0
6	pH 8.0 8.0 O2 ppm 8.9 9.4 Cond. 600 610 Temp(C) 20.0 20.0
Control	pH 8.1 8.0 O2 ppm 9.1 9.4 Cond. 600 610 Temp(C) 20.0 20.0

## TOXICITY TEST REPORT Sample: 05890028

## TEST CONDITIONS

Company : Esso Petroleum Canada  
Sarnia, ONT  
(70102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : process effluent, (300)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : C. Ferguson  
Date Collected : 04/03/89  
Received : 04/03/89  
Tested : 04/04/89 at: 1430

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol. OME, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 49:30	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890028

TEST CONC.  
% ELAPSED TIME  
00:00 49:30

100	pH 6.9 7.4 O2 ppm 7.6 8.4 Cond. 540 610 Temp(C) 20.0 20.0
50	pH 7.3 7.7 O2 ppm 8.3 8.9 Cond. 540 600 Temp(C) 20.0 20.0
26	pH 7.7 7.8 O2 ppm 8.7 9.1 Cond. 520 590 Temp(C) 20.0 20.0
13	pH 7.9 7.9 O2 ppm 8.8 9.0 Cond. 520 580 Temp(C) 20.0 20.0
6	pH 8.0 7.9 O2 ppm 8.8 9.0 Cond. 520 550 Temp(C) 20.0 20.0
Control	pH 8.0 7.9 O2 ppm 9.2 9.3 Cond. 520 550 Temp(C) 20.0 20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 05890033

## TEST CONDITIONS

Company : Esso Petroleum Canada  
Sarnia, ONT  
(70102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : process effluent, (300)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : C. Ferguson  
Date Collected : 05/01/89  
Received : 05/01/89  
Tested : 05/03/89 at: 945

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol. OME, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E	TOTAL MORTALITY
%	00:00 49:05	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890033

TEST CONC. %  
E L A P S E D T I M E  
00:00 49:05

100	pH 7.0 7.1 O2 ppm 8.6 8.2 Cond. 700 790 Temp(C) 20.0 20.0
50	pH 7.5 7.7 O2 ppm 9.4 8.4 Cond. 600 620 Temp(C) 20.0 20.0
26	pH 7.7 7.8 O2 ppm 9.4 9.2 Cond. 540 596 Temp(C) 20.0 20.0
13	pH 7.9 7.9 O2 ppm 9.6 9.3 Cond. 500 530 Temp(C) 20.0 20.0
6	pH 7.9 8.0 O2 ppm 9.6 9.3 Cond. 500 520 Temp(C) 20.0 20.0
Control	pH 8.0 8.0 O2 ppm 9.8 9.3 Cond. 490 510 Temp(C) 20.0 20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 02890105

## TEST CONDITIONS

Company : Esso Petroleum Canada  
Sarnia, ONT  
(70102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : process effluent, (300)  
Laboratory : HOE  
Sampling Method : grab  
Sampled By : D. Hamilton  
Date Collected : 05/30/89  
Received : 05/30/89  
Tested : 05/31/89 at: 1000

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol. OME, 1988)

Test Animal :  
Weight(gm) :  
Length(mm) :  
: D. magna  
:  
:

## MORTALITY DATA

TEST CONC.	ELAPSED TIME				TOTAL MORTALITY
%	00:00	01:00	24:00	48:00	%
100	0	0	0	0	0
60	0	0	0	0	0
30	0	0	0	0	0
15	0	0	0	0	0
5	0	0	0	1	8
Control	0	0	0	0	0

48 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments : MISA Audit

## TOXICITY TEST PARAMETERS

Sample Number: 02890105

TEST CONC. %  
ELAPSED TIME  
00:00 01:00 24:00 48:00

100	pH 7.5 02 ppm 9.2 Cond. 683 Temp(C) 20.0	20.0	20.0	20.0	20.0	8.0 8.5 8.5 652
60	pH 7.8 02 ppm 9.7 Cond. 521 Temp(C) 20.0	20.0	20.0	20.0	20.0	8.1 8.5 515
30	pH 8.0 02 ppm 9.8 Cond. 420 Temp(C) 20.0	20.0	20.0	20.0	20.0	8.2 8.6 412
15	pH 8.1 02 ppm 9.8 Cond. 362 Temp(C) 20.0	20.0	20.0	20.0	20.0	8.3 8.6 359
5	pH 8.2 02 ppm 9.7 Cond. 328 Temp(C) 20.0	20.0	20.0	20.0	20.0	8.3 8.6 326
Control	pH 8.2 02 ppm 9.6 Cond. 313 Temp(C) 20.0	20.0	20.0	20.0	20.0	8.3 8.6 306

## MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890017

## TEST CONDITIONS

Company : Esso Petroleum Canada  
Sarnia, ONT  
Region : Southwest  
Industry : Petroleum Refining  
Control point : CW-SEP. 11&12, (400)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : C. Ferguson  
Date Collected : 02/16/89  
Received : 02/16/89  
Tested : 02/15/89 at: 1625

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol. OME, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY %
100	0	00:00 48:15	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve : none  
LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 05890017

TEST CONC. %  
ELAPSED TIME  
00:00 48:15

100	pH 8.1 O2 ppm 7.9 Cond. 8.8 9.2 Temp(C) 208 210 20.0 20.0
50	pH 8.0 O2 ppm 7.9 Cond. 8.6 9.3 Temp(C) 410 400 20.0 20.0
26	pH 8.0 O2 ppm 8.0 Cond. 8.6 8.3 Temp(C) 300 510 20.0 20.0
13	pH 8.0 O2 ppm 8.0 Cond. 8.8 9.0 Temp(C) 490 550 20.0 20.0
6	pH 8.0 O2 ppm 8.0 Cond. 8.8 9.2 Temp(C) 600 600 20.0 20.0
Control	pH 8.0 O2 ppm 7.9 Cond. 9.0 9.0 Temp(C) 640 630 20.0 20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :  
LC50 Calculated By :

TOXICITY TEST REPORT      Sample: 05890043

TEST CONDITIONS

Company : Esso Petroleum Canada  
Sarnia, ONT  
(70102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : GW-SEP. 11&12, (400)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : C. Ferguson  
Date Collected : 05/23/89  
Received : 05/23/89  
Tested : 05/26/89 at: 1030

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol. ONE, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E		TOTAL MORTALITY
%	00:00	50:10	%
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %

Comments:

## TOXICITY TEST PARAMETERS

Sample Number: 05890043

TEST CONC. %  
E L A P S E D T I M E  
00:00 50:10

100	pH 02 ppm Cond. Temp(C)	8.0 10.2 192 20.0	7.9 9.5 210 20.0
50	pH 02 ppm Cond. Temp(C)	8.0 10.0 348 20.0	8.0 9.5 352 20.0
26	pH 02 ppm Cond. Temp(C)	8.0 9.9 420 20.0	8.1 9.5 418 20.0
13	pH 02 ppm Cond. Temp(C)	8.0 9.8 458 20.0	8.1 9.6 445 20.0
6	pH 02 ppm Cond. Temp(C)	8.0 9.9 480 20.0	8.1 9.6 459 20.0
Control	pH 02 ppm Cond. Temp(C)	7.9 9.8 498 20.0	8.1 9.4 455 20.0

NISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
LC50 Calculated By :

Sample: 05890016

TOXICITY TEST REPORT

TOXICITY TEST PARAMETERS

TEST CONDITIONS

Company : Esso Petroleum Canada  
Sarnia, ONT (70102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : CW-Sep.9, (500)  
Laboratory : PolLutech  
Sampling Method : Grab  
Sampled By : C. Ferguson  
Date Collected : 02/14/89  
Received : 02/14/89  
Tested : 02/15/89 at: 1550

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol. OME, 1988)

Test Animal : D. magna  
Height(gm) :  
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	01:15 48:50	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

Sample Number: 05890016

TEST CONC. %  
ELAPSED TIME  
01:15 48:50

100	pH 7.9 7.8 O2 ppm 9.6 9.4 Cond. 760 800 Temp(C) 20.0 20.0
50	pH 7.8 7.9 O2 ppm 9.2 9.3 Cond. 700 700 Temp(C) 20.0 20.0
26	pH 7.9 7.9 O2 ppm 9.4 9.4 Cond. 680 680 Temp(C) 20.0 20.0
13	pH 7.8 7.9 O2 ppm 9.0 9.4 Cond. 680 680 Temp(C) 20.0 20.0
6	pH 7.7 7.9 O2 ppm 8.8 9.2 Cond. 680 660 Temp(C) 20.0 20.0
Control	pH 8.0 7.9 O2 ppm 9.0 9.0 Cond. 640 660 Temp(C) 20.0 20.0

## TOXICITY TEST REPORT Sample: 05890042

## TEST CONDITIONS

Company : Esso Petroleum Canada  
Sarnia, ONT  
(70102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : CW-Sep.9, (500)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : C. Ferguson  
Date Collected : 05/23/89  
Received : 05/23/89  
Tested : 05/23/89 at: 1530

Type of Bioassay : STATIC  
Daphnia magna Acute Lethality Toxicity  
Test Protocol: ONE, 1988

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 48:00	%
100	0	8
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments :

SLOPE of Mortality Curve :  
LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 05890042

TEST CONC.  
% ELAPSED TIME  
00:00 48:00

100	pH 02 ppm Cond. Temp(C)	7.8 8.6 680 20.0	7.7 8.7 700 20.0
50	pH 02 ppm Cond. Temp(C)	7.9 9.0 580 20.0	7.8 8.9 600 20.0
26	pH 02 ppm Cond. Temp(C)	7.9 9.0 520 20.0	7.9 9.2 530 20.0
13	pH 02 ppm Cond. Temp(C)	7.9 9.0 500 20.0	7.9 9.4 505 20.0
6	pH 02 ppm Cond. Temp(C)	7.9 9.0 488 20.0	7.9 9.4 505 20.0
Control	pH 02 ppm Cond. Temp(C)	7.9 9.4 478 20.0	7.9 9.4 489 20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
 LC50 Calculated by :

TOXICITY TEST REPORT Sample: 05890015

## TEST CONDITIONS

Company : Esso Petroleum Canada  
 Sarnia, ONT  
 (70102)  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : CM-Sep.3, (600)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : C. Ferguson  
 Date Collected : 02/14/89  
 Received : 02/14/89  
 Tested : 02/15/89 at: 1515

Type of Bioassay : STATIC  
 (Daphnia magna Acute Lethality Toxicity  
 Test Protocol, ONE, 1988)

Test Animal : D. magna  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 47:25	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal  
 95% fid. limits : 0.0 - 0.0 %  
 Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890015

TEST CONC. %  
 ELAPSED TIME  
 00:00 47:25

100	pH 7.6 7.7 O2 ppm 10.4 9.5 Cond. 192 210 Temp(C) 20.0 20.0
50	pH 7.7 7.8 O2 ppm 9.4 9.4 Cond. 410 420 Temp(C) 20.0 20.0
26	pH 7.7 7.9 O2 ppm 9.2 9.4 Cond. 520 520 Temp(C) 20.0 20.0
13	pH 7.7 7.9 O2 ppm 9.0 9.5 Cond. 580 600 Temp(C) 20.0 20.0
6	pH 7.7 7.9 O2 ppm 9.0 9.6 Cond. 620 600 Temp(C) 20.0 20.0
Control	pH 8.0 7.9 O2 ppm 9.0 9.4 Cond. 640 650 Temp(C) 20.0 20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :  
LC50 Calculated By :

Sample: 05890041

## TOXICITY TEST REPORT

## TEST CONDITIONS

Company : Esso Petroleum Canada  
Sarnia, ONT  
(70102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : CW-Sep.3, (600)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : C. Ferguson  
Date Collected : 05/23/89  
Received : 05/23/89  
Tested : 05/23/89 at: 1510

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, OME, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 48:00	%
100	0	0
50	0	0
26	0	25
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890041

TEST CONC. %

ELAPSED TIME

00:00 48:00

100	pH 7.8 7.6 O2 ppm 9.4 8.8 Cond. 188 202 Temp(C) 20.0 20.0
50	pH 7.9 7.8 O2 ppm 9.2 8.8 Cond. 388 355 Temp(C) 20.0 20.0
26	pH 8.0 7.9 O2 ppm 9.0 9.4 Cond. 406 425 Temp(C) 20.0 20.0
13	pH 8.0 7.9 O2 ppm 9.2 9.4 Cond. 440 462 Temp(C) 20.0 20.0
6	pH 8.0 7.9 O2 ppm 9.1 9.4 Cond. 452 480 Temp(C) 20.0 20.0
Control	pH 7.9 7.9 O2 ppm 9.4 9.4 Cond. 478 488 Temp(C) 20.0 20.0



COMPANY: Petro-Canada Inc., Mississauga  
(130104)  
(now with Clarkson Refinery)  
SECTOR: Petroleum Refining  
REGION: Central

#### SUMMARY

The data for six trout bioassays, conducted on process effluent samples collected between December 1988 and May 1989, were provided by Petro-Canada Incorporated. All six process effluent samples were determined to have been non-acutely lethal to test fish. Trout bioassays conducted on cooling water samples collected in February and May 1989 indicate the samples were not acutely lethal. Bioassay data for one intake water sample collected in February indicate the sample was not acutely lethal to test fish.

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#### Process Effluent

06881219 sampled: 12/13/88 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or sublethal impairment observed

06890113 sampled: 01/17/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: 10 % mortality in full strength effluent

06890207 sampled: 02/07/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or sublethal impairment observed

06890334 sampled: 03/21/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mort. or sublethal impairment observed

06890422 sampled: 04/11/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or sublethal impairment observed

06890508 sampled: 05/02/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or sublethal impairment observed

storm water

Petro-Canada Inc. (continued)

cooling water-trap 1

06890223 sampled: 02/27/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or sublethal impairment observed

06890523 sampled: 05/09/89 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 40 % mort. in full strength effluent

cooling water-trap 3

06890224 sampled: 02/27/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or sublethal impairment observed

06890525 sampled: 05/09/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or sublethal impairment observed

intake water

SLOPE OF Mortality Curve : moving average  
LC50 Calculated By :

Sample: 06881219

TOXICITY TEST REPORT

TOXICITY TEST PARAMETERS

TEST CONDITIONS

Company : Petro-Canada Inc.  
(13-124)  
Region : Central  
Industry : Petroleum Refining  
Control points : Process Effluent, (100)  
Laboratory : Beck  
Sampling Method : grab  
Sampled By : Tom Tubello  
Date Collected : 12/13/88  
Received : 12/13/88  
Tested : 12/13/88 at: 1400

Type of Exposure : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish, OIE, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

MORTALITY DATA

TEST CONC.	E	A	S	F	O	T	I	M	E	TOTAL MORTALITY	%
%	00:00	24:00	48:00	72:00	96:00						
100	0	0	0	0	0					0	
50	0	0	0	0	0					0	
30	0	0	0	0	0					0	
20	0	0	0	0	0					0	
10	0	0	0	0	0					0	
Control	0	0	0	0	0					0	

95% Upper LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments : no mortality or sublethal impairment observed

Sample Number: 06881219

TEST CONC. %  
ELAPSED TIME  
00:00 24:00 48:00 72:00 96:00

100	pH 7.2	8.0	8.0	7.9	8.1
	O2 ppm 8.0	8.8	8.6	8.3	9.2
	Cond. 584				574
	Temp(C) 15.0	15.0	15.0	15.0	15.0
50	pH 7.4	7.7	7.9	7.8	7.9
	O2 ppm 7.4	7.8	7.2	7.4	7.6
	Cond. 455				438
	Temp(C) 15.0	15.0	15.0	15.0	15.0
30	pH 7.5	8.0	8.2	8.1	8.2
	O2 ppm 9.3	8.8	9.4	8.3	8.6
	Cond. 431				418
	Temp(C) 15.0	15.0	15.0	15.0	15.0
20	pH 7.5	8.0	8.3	8.3	8.3
	O2 ppm 9.2	9.6	9.4	9.9	9.9
	Cond. 414				415
	Temp(C) 15.0	15.0	15.0	15.0	15.0
10	pH 7.6	8.0	8.3	8.3	8.3
	O2 ppm 8.8	9.6	9.6	9.7	9.8
	Cond. 405				410
	Temp(C) 15.0	15.0	15.0	15.0	15.0
Control	pH 7.9	8.2	8.3	8.1	8.3
	O2 ppm 9.7	10.4	9.4	9.4	9.9
	Cond. 317				336
	Temp(C) 15.0	15.0	15.0	15.0	15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :  
LC50 Calculated By : moving average

## TOXICITY TEST REPORT Sample: 06890113

## TEST CONDITIONS

Company : Petro-Canada Inc.  
Mississauga, ONT  
(130104)  
Region : Central  
Industry : Petroleum Refining  
Control point : Process Effluent, (100)  
Laboratory : Beak  
Sampling Method : grab  
Sampled By : Tom Tubello  
Date Collected : 01/17/89  
Received : 01/17/89  
Tested : 01/17/89 at: 1630

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	1	10
50	0	0	1	2	3	30
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : 10 % mortality in full strength effluent

## TOXICITY TEST PARAMETERS

Sample Number: 06890113

TEST CONC. %	ELAPSED TIME			
	00:00	24:00	48:00	72:00 96:00
100	pH 7.6 O2 ppm 7.6 Cond. 679 Temp(C) 15.0	pH 7.8 O2 ppm 8.0 Cond. 679 Temp(C) 15.0	pH 7.9 O2 ppm 7.4 Cond. 679 Temp(C) 15.0	pH 7.7 O2 ppm 7.4 Cond. 702 Temp(C) 15.0
50	pH 7.7 O2 ppm 8.2 Cond. 353 Temp(C) 15.0	pH 7.8 O2 ppm 7.4 Cond. 353 Temp(C) 15.0	pH 7.9 O2 ppm 8.1 Cond. 347 Temp(C) 15.0	pH 7.7 O2 ppm 7.6 Cond. 347 Temp(C) 15.0
30	pH 7.8 O2 ppm 7.8 Cond. 466 Temp(C) 15.0	pH 8.1 O2 ppm 8.8 Cond. 466 Temp(C) 15.0	pH 8.0 O2 ppm 8.0 Cond. 474 Temp(C) 15.0	pH 7.9 O2 ppm 8.2 Cond. 474 Temp(C) 15.0
20	pH 7.9 O2 ppm 8.7 Cond. 433 Temp(C) 15.0	pH 8.1 O2 ppm 9.4 Cond. 433 Temp(C) 15.0	pH 8.1 O2 ppm 8.5 Cond. 442 Temp(C) 15.0	pH 8.2 O2 ppm 10.4 Cond. 442 Temp(C) 15.0
10	pH 7.8 O2 ppm 8.9 Cond. 399 Temp(C) 15.0	pH 7.8 O2 ppm 8.0 Cond. 399 Temp(C) 15.0	pH 8.2 O2 ppm 9.3 Cond. 391 Temp(C) 15.0	pH 8.1 O2 ppm 8.8 Cond. 391 Temp(C) 15.0
Control	pH 7.9 O2 ppm 9.0 Cond. 363 Temp(C) 15.0	pH 8.2 O2 ppm 9.4 Cond. 363 Temp(C) 15.0	pH 8.1 O2 ppm 9.8 Cond. 357 Temp(C) 15.0	pH 8.0 O2 ppm 9.6 Cond. 357 Temp(C) 15.0

Sample: 06890207

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Petro-Canada Inc.  
 (130164)  
 Region : Central  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (100)  
 Laboratory : Beek  
 Sampling Method : grab  
 Sampled By : Tom Tubello  
 Date Collected : 02/07/89  
 Received : 02/07/89  
 Tested : 02/07/89 at: 1230  
 Type of Bioassay : STATIC  
 (protocol to determine the acute lethality  
 of liquid effluents to fish, ONE, 1983).  
 : Rainbow trout  
 :  
 :  
 Test Animal  
 Weight(gm)  
 Length(mm)

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E				TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00
100	0	0	0	0	0
50	0	0	0	0	0
20	0	0	0	0	0
10	0	0	0	0	0
Control	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

## TOXICITY TEST PARAMETERS

Sample Number: 06890207

TEST CONC. %	E L A P S E D T I M E					
	00:00	24:00	48:00	72:00	96:00	
100	pH 7.4 O2 ppm 8.2 Cond. 1445 Temp(C) 15.0	8.0 7.4 9.4 10.0	8.1 8.1 10.0 15.0	8.1 8.1 15.0 16.0	8.1 8.1 16.0 16.0	
50	pH 7.5 O2 ppm 9.5 Cond. 607 Temp(C) 15.0	8.1 8.1 10.0 10.6	8.1 8.1 10.2 10.1	8.1 8.1 15.0 16.0	8.1 8.1 16.0 16.0	
30	pH 7.5 O2 ppm 9.8 Cond. 513 Temp(C) 15.0	8.1 8.1 10.2 10.4	8.1 8.1 15.0 15.0	8.1 8.1 16.0 16.0	8.1 8.1 16.0 16.0	
20	pH 7.4 O2 ppm 9.6 Cond. 461 Temp(C) 15.0	7.9 8.1 9.0 9.2	8.1 8.1 15.0 15.0	8.1 8.1 16.0 16.0	8.1 8.1 16.0 16.0	
10	pH 7.3 O2 ppm 9.8 Cond. 407 Temp(C) 15.0	8.0 8.1 10.1 9.6	8.1 8.1 15.0 15.0	8.1 8.1 16.0 16.0	8.1 8.1 16.0 16.0	
Control	pH 7.4 O2 ppm 9.8 Cond. 382 Temp(C) 15.0	7.8 7.9 10.0 10.2	7.9 7.8 15.0 15.0	7.8 7.8 16.0 16.0	7.8 7.8 16.0 16.0	

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : moving average  
LC50 Calculated By :

Sample: 06890334

## TOXICITY TEST REPORT

## TEST CONDITIONS

Company : Petro-Canada Inc.  
Mississauga, ONT  
(130104)  
Region : Central  
Industry : Petroleum Refining  
Control point : Process Effluent, (100)  
Laboratory : Beak  
Sampling Method : grab  
Sampled By : Tom Tubello  
Date Collected : 03/21/89  
Received : 03/21/89  
Tested : 03/22/89 at: 1130  
Type of Bioassay : STATIC  
(protocol to determine the acute lethality  
of liquid effluents to fish, OME, 1983).  
Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
	%	00:00	24:00	48:00	72:00	96:00
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mort. or sublethal impairment observed

## TOXICITY TEST PARAMETERS

Sample Number: 06890334

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	7.3	7.8	8.0	8.3	8.4
	O2 ppm	9.2	9.8	9.5	9.4	9.3
	Temp(C)	697	15.0	14.0	15.0	14.0
50	pH	7.4	7.8	8.0	8.3	8.3
	O2 ppm	9.7	9.9	7.9	8.7	8.7
	Temp(C)	532	15.0	14.0	15.0	14.0
30	pH	7.4	8.0	8.0	8.4	8.5
	O2 ppm	9.6	10.4	8.9	10.0	8.8
	Temp(C)	468	15.0	14.0	15.0	14.0
20	pH	7.4	8.0	8.0	8.3	8.4
	O2 ppm	9.8	9.8	9.4	9.4	8.4
	Temp(C)	434	15.0	14.0	15.0	14.0
10	pH	7.4	7.9	8.0	8.3	8.4
	O2 ppm	9.4	9.3	9.2	8.4	9.5
	Temp(C)	404	15.0	14.0	15.0	14.0
Control	pH	7.3	7.9	7.9	8.3	8.5
	O2 ppm	8.9	8.2	8.2	7.2	8.9
	Temp(C)	372	15.0	14.0	15.0	14.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :  
LC50 Calculated By : moving average

TOXICITY TEST REPORT Sample: 06890422

## TEST CONDITIONS

Company : Petro-Canada Inc.  
Mississauga, ONT  
(130104)  
Region : Central  
Industry : Petroleum Refining  
Control point : Process Effluent, (100)  
Laboratory : Beak  
Sampling Method : grab  
Sampled By : Tom Tubello  
Date Collected : 04/11/89  
Received : 04/11/89  
Tested : 04/11/89 at: 1500

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

## TOXICITY TEST PARAMETERS

Sample Number: 06890422

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH 02 ppm Cond. Temp(C)	7.4 8.8 610 15.0	7.8 8.0 14.0 14.0	8.0 9.0 14.0 15.0	8.0 9.1 15.0	7.9 9.0 652 15.0
50	pH 02 ppm Cond. Temp(C)	7.6 9.9 204 15.0	8.1 9.6 14.0 14.0	8.2 9.8 15.0	8.1 8.7 15.0	8.1 509 15.0
30	pH 02 ppm Cond. Temp(C)	7.5 9.7 464 15.0	7.8 8.9 7.2 14.0	7.9 8.2 9.5 14.0	8.1 9.3 461 15.0	8.1 9.3 461 15.0
20	pH 02 ppm Cond. Temp(C)	7.5 9.4 439 15.0	7.9 8.0 8.0 14.0	8.0 8.8 428 15.0	8.1 8.4 428 15.0	8.1 8.4 428 15.0
10	pH 02 ppm Cond. Temp(C)	7.4 8.9 405 15.0	7.8 8.1 14.0 14.0	7.8 8.2 14.0 14.0	8.1 8.0 393 15.0	8.1 8.0 393 15.0
Control	pH 02 ppm Cond. Temp(C)	7.9 9.2 379 15.0	7.8 8.0 14.0 14.0	8.0 8.6 14.0 14.0	7.9 8.6 371 15.0	7.9 8.6 371 15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :  
LC50 Calculated By : moving average

## TOXICITY TEST REPORT Sample: 06890508

## TEST CONDITIONS

Company : Petro-Canada Inc.  
Mississauga, ONT  
(130104)  
Region : Central  
Industry : Petroleum Refining  
Control point : Process Effluent, (100)  
Laboratory : Beak  
Sampling Method : grab  
Sampled By : Karen Gregory  
Date Collected : 05/02/89  
Received : 05/02/89  
Tested : 05/03/89 at: 1200

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish, OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
65	0	0	0	0	0	0
30	0	0	0	0	0	0
30	0	0	0	0	0	0
30	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

## TOXICITY TEST PARAMETERS

Sample Number: 06890508

TEST CONC.	E L A P S E D T I M E				
%	00:00	24:00	48:00	72:00	96:00
100	pH 7.4 O2 ppm 6.8 Cond. 596 Temp(C) 15.0	8.1 8.1 10.0 9.5 15.0 14.0	8.1 8.1 9.5 8.7 15.0 15.0	8.1 8.1 9.0 591	8.1 9.0 591 15.0
65	pH 7.6 O2 ppm 7.4 Cond. 509 Temp(C) 15.0	8.1 8.1 9.1 9.6 15.0 14.0	8.1 8.1 8.8 8.0 15.0 15.0	8.1 8.1 511 15.0	8.1 9.0 511 15.0
50	pH 7.6 O2 ppm 7.8 Cond. 474 Temp(C) 15.0	8.1 8.1 9.0 9.7 15.0 14.0	8.1 8.1 8.3 15.0	8.1 9.0 472 15.0	8.1 9.0 472 15.0
30	pH 7.6 O2 ppm 7.4 Cond. 425 Temp(C) 15.0	8.1 8.1 9.6 9.8 15.0 14.0	8.2 8.2 9.3 15.0	8.2 9.1 424 15.0	8.2 9.1 424 15.0
20	pH 7.6 O2 ppm 8.6 Cond. 404 Temp(C) 15.0	8.0 8.2 8.8 10.3 15.0 14.0	8.2 8.2 9.9 15.0	8.2 9.1 402 15.0	8.2 9.1 402 15.0
10	pH 7.7 O2 ppm 9.6 Cond. 383 Temp(C) 15.0	8.2 8.1 9.2 9.3 15.0 14.0	8.1 8.3 9.5 15.0	8.3 7.7 373 15.0	8.3 7.7 373 15.0
Control	pH 7.6 O2 ppm 9.4 Cond. 358 Temp(C) 15.0	7.9 7.8 9.4 8.2 15.0 14.0	8.3 8.3 9.5 15.0	8.3 9.2 349 15.0	8.0 9.2 349 15.0

SLOPE of Mortality Curve :  
LC50 Calculated By : moving average

## TOXICITY TEST REPORT Sample: 06890223

## TEST CONDITIONS

Company : Petro-Canada Inc.  
Mississauga, ONT  
(130104)  
Region : Central  
Industry : Petroleum Refining  
Control point : cooling water-trap 1, (300)  
Laboratory : Beak  
Sampling Method : grab  
Sampled By : Tom Tubello  
Date Collected : 02/27/89  
Date Received : 02/27/89  
Tested : at: 1500

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. OME, 1983).

Test Animal :  
Weight(gm)  
Length(mm)

: Rainbow trout  
:  
:

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

## TOXICITY TEST PARAMETERS

Sample Number: 06890223

TEST CONC. %  
E L A P S E D T I M E  
00:00 24:00 48:00 72:00 96:00

100	pH 02 ppm Cond. Temp(C)	8.1 11.4 346 15.0	7.9 10.0 346 14.0	8.2 10.6 380 14.0	8.1 10.3 380 15.0
50	pH 02 ppm Cond. Temp(C)	7.9 10.6 374 15.0	7.9 8.8 374 14.0	8.0 9.2 393 15.0	8.1 9.4 393 15.0
30	pH 02 ppm Cond. Temp(C)	7.9 10.6 384 15.0	8.2 10.6 384 14.0	8.1 10.3 392 15.0	8.1 10.4 392 15.0
20	pH 02 ppm Cond. Temp(C)	7.9 9.9 388 15.0	8.1 9.4 391 14.0	8.2 9.4 391 15.0	8.1 9.6 391 15.0
10	pH 02 ppm Cond. Temp(C)	7.9 9.3 380 15.0	7.8 8.9 360 14.0	8.1 10.0 377 15.0	8.1 8.5 377 15.0
Control	pH 02 ppm Cond. Temp(C)	7.7 9.8 397 15.0	7.8 10.4 397 14.0	7.9 9.6 379 15.0	8.0 9.6 379 15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : probit  
LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 06890523

## TEST CONDITIONS

Company : Petro-Canada Inc.  
(130104)  
Region : Central  
Industry : Petroleum Refining  
Control point : cooling water-trap 1, (300)  
Laboratory : Beak  
Sampling Method : grab  
Sampled By : Karen Gregory  
Date Collected : 05/09/89  
Received : 05/09/89  
Tested : 05/09/89 at: 1600

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME				TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00
100	0	1	2	2	4
65	0	0	0	0	0
30	0	0	1	1	1
30	0	0	0	1	1
20	0	1	1	2	2
10	0	0	0	0	0
Control	0	0	0	0	0

96 Hour LC50 : >100%

95% fid. limits : 0.0 - 0.0 %

Comments : 40 % mort. in full strength effluent

## TOXICITY TEST PARAMETERS

Sample Number: 06890523

TEST CONC.	ELAPSED TIME			
%	00:00	24:00	48:00	72:00
100	pH 8.2 O2 ppm 10.4 Cond. 344 Temp(C) 15.0	8.2 8.3 10.2 9.0 344 15.0	8.2 8.3 10.2 9.0 344 15.0	8.2 8.2 9.0 9.0 344 15.0
65	pH 8.0 O2 ppm 9.2 Cond. 346 Temp(C) 15.0	8.2 8.2 8.7 8.2 346 15.0	8.2 8.2 8.6 8.6 347 15.0	8.2 8.2 8.6 8.6 347 15.0
50	pH 7.9 O2 ppm 9.0 Cond. 346 Temp(C) 15.0	8.2 8.3 9.7 8.2 346 15.0	8.2 8.3 8.9 8.5 352 15.0	8.2 8.2 8.9 8.5 352 15.0
30	pH 7.8 O2 ppm 9.3 Cond. 348 Temp(C) 15.0	8.2 8.3 8.7 9.3 348 15.0	8.2 8.3 8.5 8.7 353 15.0	8.1 8.1 8.7 8.7 353 15.0
20	pH 7.8 O2 ppm 9.3 Cond. 348 Temp(C) 15.0	8.2 8.2 9.0 8.3 348 15.0	8.2 8.3 8.3 8.3 357 15.0	8.1 8.1 8.3 8.3 357 15.0
10	pH 7.8 O2 ppm 9.3 Cond. 350 Temp(C) 15.0	8.2 8.2 9.0 7.0 350 15.0	8.1 8.1 7.6 6.5 363 15.0	8.0 8.0 6.5 6.5 363 15.0
Control	pH 7.7 O2 ppm 9.8 Cond. 352 Temp(C) 15.0	8.2 8.3 8.3 8.8 352 15.0	8.2 8.2 8.5 8.3 374 15.0	8.2 8.2 8.5 8.5 374 15.0

SLOPE of Mortality Curve :  
LC50 Calculated By : moving average

TOXICITY TEST REPORT Sample: 06890224

## TEST CONDITIONS

Company : Petro-Canada Inc.  
Address : Mississauga, ONT  
(L3B 1G1)  
Region : Central  
Industry : Petroleum Refining  
Control point : cooling water-trap 3, (500)  
Laboratory : Beak  
Sampling Method : grab  
Sampled By : Tom Tubello  
Date Collected : 02/27/89  
Received : 02/27/89  
Tested : 02/27/89 at: 1530

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

## TOXICITY TEST PARAMETERS

Sample Number: 06890224

TEST CONC. %  
E L A P S E D T I M E  
00:00 24:00 48:00 72:00 96:00

100	pH	9.0	8.5	8.0	8.2	8.1
	O2 ppm	12.0	8.8	10.0	10.6	10.3
	Cond.	437				493
50	Temp(C)	15.0	14.0	14.0	15.0	15.0
	pH	8.5	8.1	8.1	8.1	8.0
	O2 ppm	10.4	10.4	10.6	10.7	10.4
30	Cond.	420				440
	Temp(C)	15.0	14.0	14.0	15.0	15.0
	pH	8.2	7.9	8.0	8.1	7.9
20	O2 ppm	10.2	9.5	9.4	9.5	9.1
	Cond.	413				420
	Temp(C)	15.0	14.0	14.0	15.0	15.0
10	pH	8.0	7.9	8.0	8.1	8.0
	O2 ppm	10.6	10.5	10.2	9.7	9.1
	Cond.	410				405
Control	Temp(C)	15.0	14.0	14.0	15.0	15.0
	pH	7.9	7.8	7.9	8.0	7.9
	O2 ppm	9.4	9.0	8.5	8.8	8.1
Control	Cond.	405				395
	Temp(C)	15.0	14.0	14.0	15.0	15.0
	pH	7.7	7.8	7.9	8.0	7.8
Control	O2 ppm	9.8	10.2	10.4	9.6	10.0
	Cond.	397				379
	Temp(C)	15.0	14.0	14.0	15.0	15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : moving average  
LC50 Calculated by :

## TOXICITY TEST REPORT Sample: 06890525

## TEST CONDITIONS

Company : Petro-Canada Inc.  
(130104)  
Region : Central  
Industry : Petroleum Refining  
Control point : cooling water-trap 3, (500)  
Laboratory : Beak  
Sampling Method : grab  
Sampled By : Karen Gregory  
Date Collected : 05/09/89  
Received : 05/09/89  
Tested : 05/09/89 at: 1630

## Type of Bioassay

: STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. OME, 1983).

Test Animal  
Weight(gm)  
Length(mm)

: Rainbow trout  
:  
:

## MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
65	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

## TOXICITY TEST PARAMETERS

Sample Number: 06890525

TEST  
CONC.  
%

ELAPSED TIME

00:00 24:00 48:00 72:00 96:00

100	pH	8.7	8.5	8.3	8.3	8.2
	02 ppm	9.7	8.1	9.0	8.8	8.4
	Cond.	400				406
	Temp(C)	15.0	15.0	15.0	15.0	15.0
65	pH	8.4	8.1	8.2	8.2	8.2
	02 ppm	9.2	8.2	8.8	8.3	8.7
	Cond.	381				396
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	8.1	8.2	8.2	8.1	8.1
	02 ppm	9.8	8.3	8.0	8.2	8.2
	Cond.	374				393
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	8.0	8.1	8.1	8.0	8.0
	02 ppm	9.7	8.5	8.0	9.0	7.3
	Cond.	364				373
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	7.8	8.1	8.2	8.1	8.1
	02 ppm	9.9	8.2	8.2	7.9	7.8
	Cond.	359				374
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.8	8.1	8.2	8.1	8.1
	02 ppm	10.0	8.3	7.9	8.2	8.5
	Cond.	351				377
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.7	8.2	8.3	8.2	8.2
	02 ppm	9.8	8.3	8.8	8.3	8.5
	Cond.	352				374
	Temp(C)	15.0	15.0	15.0	15.0	15.0

COMPANY: Petro-Canada Inc., Mississauga  
(130104)  
(now with Clarkson Refinery)  
SECTOR: Petroleum Refining  
REGION: Central

#### SUMMARY

Results of eleven Daphnia magna acute lethality toxicity tests conducted on samples collected between December 1988 and May 1989 were submitted by Petro-Canada Inc. in Mississauga. Five of the six Process Effluent samples were not acutely lethal to Daphnia. The sample collected in January was toxic to Daphnia with a 48 h LC50 value of 28.2% effluent.

One sample of Intake Water and two samples from each of Cooling Water Trap 1 and Cooling Water Trap 3 were all not acutely lethal to Daphnia.

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#### Process Effluent

06881224 sampled: 12/13/88 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: 20 % mortality in full strength effluent

06890116 sampled: 01/17/89 LC50: 28.2 %  
95% fid. limits: 20.4 - 38.8 %  
comments:

06890208 sampled: 02/07/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no immobility observed during testing

06890332 sampled: 03/21/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or immobility observed in 48 Hrs

06890423 sampled: 04/11/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or immobility observed

06890509 sampled: 05/02/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or immobility observed in 48 Hrs

Petro-Canada Inc. (continued)

storm water

cooling water-trap 1

06890225 sampled: 02/27/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: 5 % circling at the end of exposure

06890524 sampled: 05/09/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or immobility observed in 48 Hrs

cooling water-trap 3

06890226 sampled: 02/27/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: 70 % of Daphnia floating at the end of expos.

06890526 sampled: 05/09/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or immobility observed in 48 Hrs

intake water

06890209 sampled: 02/07/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no immobility observed during testing

TOXICITY TEST REPORT Sample: 06881224

TEST CONDITIONS

Company : Petro-Canada Inc.  
 : Mississauga, ONT  
 : (130104)  
 Region : Central  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (100)  
 Laboratory : BEAK  
 Sampling Method : Grab  
 Sampled By : Tom Tubello  
 Date Collected : 12/13/88  
 Date Received : 12/13/88  
 Tested : 12/14/88 at: 1100

Type of Bioassay : STATIC  
 (Daphnia magna Acute Lethality Toxicity  
 Test Protocol, OME, 1988)

Test Animal : D. magna  
 Weight(gm) :  
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E		TOTAL MORTALITY
%	00:00	24:00	48:00
100	0	0	20
50	0	0	0
30	0	0	20
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Not Lethal  
 95% fid. limits : 0.0 - 0.0 %  
 Comments : 20 % mortality in full strength effluent

SLOPE of Mortality Curve :  
 LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 06881224

TEST CONC. %

E L A P S E D T I M E

00:00 24:00 48:00

100	pH 7.2	7.5
	O2 ppm 5.6	4.1
	Cond. 582	627
	Temp(C) 20.0	20.0
50	pH 7.6	7.8
	O2 ppm 6.3	5.4
	Cond. 547	506
	Temp(C) 20.0	20.0
30	pH 7.7	7.9
	O2 ppm 6.3	6.2
	Cond. 421	456
	Temp(C) 20.0	20.0
20	pH 7.8	8.0
	O2 ppm 5.8	5.8
	Cond. 391	427
	Temp(C) 20.0	20.0
10	pH 8.0	8.0
	O2 ppm 6.6	5.5
	Cond. 374	429
	Temp(C) 20.0	20.0
Control	pH 8.2	7.6
	O2 ppm 6.9	6.5
	Cond. 339	335
	Temp(C) 20.0	20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :  
LC50 Calculated By : moving average

## TOXICITY TEST REPORT Sample: 06890116

## TEST CONDITIONS

Company : Petro-Canada Inc.  
Mississauga, ONT  
(130104)  
Region : Central  
Industry : Petroleum Refining  
Control point : Process Effluent, (100)  
Laboratory : Beak  
Sampling Method : grab  
Sampled By : Tom Tubello  
Date Collected : 01/17/89  
Received : 01/17/89  
Tested : 01/17/89 at: 1500  
Type of Bioassay : STATIC  
Daphnia magna Acute Lethality Toxicity  
Test Protocol: OME, 1988)  
Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E		TOTAL MORTALITY
%	00:00	24:00 48:00	%
100	0	2	10
50	0	1	9
30	0	0	3
20	0	0	4
10	0	0	1
Control	0	0	0

48 Hour LC50 : 28.2 %  
95% fid. limits : 20.4 - 38.8 %  
Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 06890116

TEST CONC.  
%  
E L A P S E D T I M E  
00:00 24:00 48:00

100	pH O2 ppm Cond. Temp(C)	7.3 6.1 709 20.0	7.9 8.3 735 20.0
50	pH O2 ppm Cond. Temp(C)	7.6 9.1 552 20.0	8.1 8.5 583 20.0
30	pH O2 ppm Cond. Temp(C)	7.8 9.2 493 20.0	8.1 8.4 518 20.0
20	pH O2 ppm Cond. Temp(C)	7.9 9.2 451 20.0	8.1 8.4 486 20.0
10	pH O2 ppm Cond. Temp(C)	8.0 9.3 419 20.0	8.2 8.6 450 20.0
Control	pH O2 ppm Cond. Temp(C)	8.1 9.2 385 20.0	8.2 8.7 432 20.0

Sample: 06890208

TOXICITY TEST REPORT

## TEST CONDITIONS

Company : Petro-Canada Inc.  
 (13010 Sauge, ONT)  
 Region : Central  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (100)

Laboratory : Beak  
 Sampling Method : Grab  
 Sampled By : Tom Tubello  
 Date Collected : 02/07/89  
 Received : 02/07/89  
 Tested : 02/07/89 at: 1430

Type of Bioassay : STATIC  
 (Daphnia magna Acute Lethality Toxicity  
 Test Protocol, OME, 1988)

Test Animal : D. magna  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no immobility observed during testing

## TOXICITY TEST PARAMETERS

Sample Number: 06890208

TEST CONC. %  
 E L A P S E D T I M E  
 00:00 24:00 48:00

100	pH 7.3 O2 ppm 7.4 Cond. 660 Temp(C) 20.0	20.0	20.0	20.0	8.1 8.0 740 20.0
50	pH 7.7 O2 ppm 8.1 Cond. 500 Temp(C) 20.0	20.0	20.0	20.0	8.1 8.0 556 20.0
30	pH 8.0 O2 ppm 8.2 Cond. 390 Temp(C) 20.0	20.0	20.0	20.0	8.1 8.0 436 20.0
20	pH 8.1 O2 ppm 8.1 Cond. 375 Temp(C) 20.0	20.0	20.0	20.0	8.2 8.1 421 20.0
10	pH 8.1 O2 ppm 8.6 Cond. 350 Temp(C) 20.0	20.0	20.0	20.0	8.2 8.6 350 20.0
Control	pH 8.0 O2 ppm 8.6 Cond. 325 Temp(C) 20.0	20.0	20.0	20.0	8.1 8.4 344 20.0

## HISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : moving average  
LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 06890332

## TEST CONDITIONS

Company : Petro-Canada Inc.  
(130104)  
Region : Central  
Industry : Petroleum Refining  
Control point : Process Effluent, (100)  
Laboratory : Beak  
Sampling Method : grab  
Sampled By : Tom Tubello  
Date Collected : 03/21/89  
Received : 03/21/89  
Tested : 03/21/89 at: 1730

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, ONE, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 24:00 48:00	%
100	0 0 0	0
50	0 0 0	0
30	0 0 0	0
20	0 0 0	0
10	0 0 0	0
Control	0 0 0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed in 48 Hrs

## TOXICITY TEST PARAMETERS

Sample Number: 06890332

TEST CONC. %  
ELAPSED TIME  
00:00 24:00 48:00

100	pH 7.3 02 ppm 8.8 Cond. 712 Temp(C) 20.0	20.0	20.0	20.0	8.0 8.3 708 20.0
50	pH 7.6 02 ppm 8.9 Cond. 570 Temp(C) 20.0	20.0	20.0	20.0	8.1 8.4 556 20.0
30	pH 7.9 02 ppm 9.0 Cond. 512 Temp(C) 20.0	20.0	20.0	20.0	8.1 8.4 494 20.0
20	pH 8.0 02 ppm 8.8 Cond. 479 Temp(C) 20.0	20.0	20.0	20.0	8.1 8.4 456 20.0
10	pH 8.1 02 ppm 8.9 Cond. 448 Temp(C) 20.0	20.0	20.0	20.0	8.2 8.5 419 20.0
Control	pH 8.2 02 ppm 8.9 Cond. 418 Temp(C) 20.0	20.0	20.0	20.0	8.2 8.3 402 20.0

Sample: 06890423

## TOXICITY TEST REPORT

## TEST CONDITIONS

Company : Petro-Canada Inc.  
(Mississauga, ONT  
(130104)  
Region : Central  
Industry : Petroleum Refining  
Control point : Process Effluent, (100)  
Laboratory : Beak  
Sampling Method : grab  
Sampled By : Tom Tubello  
Date Collected : 04/11/89  
Received : 04/11/89  
Tested : 04/11/89 at: 1600

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol. OME, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME			TOTAL MORTALITY
%	00:00	24:00	48:00	%
100	0	0	0	0
50	0	0	0	0
30	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed

## TOXICITY TEST PARAMETERS

Sample Number: 06890423

TEST CONC. %

ELAPSED TIME

00:00 24:00 48:00

100	pH 7.3	8.1
	O2 ppm 8.8	7.0
	Cond. 685	686
	Temp(C) 20.0	20.0
50	pH 7.7	8.1
	O2 ppm 9.0	8.0
	Cond. 535	532
	Temp(C) 20.0	20.0
30	pH 7.9	8.2
	O2 ppm 9.0	8.2
	Cond. 472	478
	Temp(C) 20.0	20.0
20	pH 8.0	8.2
	O2 ppm 9.0	8.3
	Cond. 442	448
	Temp(C) 20.0	20.0
10	pH 8.1	8.3
	O2 ppm 9.1	8.5
	Cond. 412	422
	Temp(C) 20.0	20.0
Control	pH 8.2	8.2
	O2 ppm 9.0	8.4
	Cond. 382	391
	Temp(C) 20.0	20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : moving average  
 LC50 Calculated By :

TOXICITY TEST REPORT Sample: 06890509

## TEST CONDITIONS

Company : Petro-Canada Inc.  
 (130104)  
 Region : Central  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (100)  
 Laboratory : Beak  
 Sampling Method : grab  
 Sampled by : Karen Gregory  
 Date Collected : 05/02/89  
 Date Received : 05/02/89  
 Tested : 05/02/89 at: 1305

Type of Bioassay : STATIC  
 (Daphnia magna Acute Lethality Toxicity  
 Test Protocol. OME, 1988)

Test Animal : D. magna  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E		TOTAL MORTALITY
%	00:00	24:00 48:00	%
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal  
 95% fid. limits : 0.0 - 0.0 %  
 Comments : no mortality or immobility observed in 48 Hrs

## TOXICITY TEST PARAMETERS

Sample Number: 06890509

TEST CONC.  
 %

E L A P S E D T I M E  
 00:00 24:00 48:00

100	pH 7.4 O2 ppm 8.3 Cond. 590 Temp(C) 20.0	20.0	20.0	21.0	8.0 8.3 629 21.0
50	pH 7.8 O2 ppm 8.1 Cond. 468 Temp(C) 20.0	20.0	20.0	21.0	8.1 8.4 502 21.0
30	pH 8.0 O2 ppm 8.9 Cond. 418 Temp(C) 20.0	20.0	20.0	21.0	8.2 8.5 453 21.0
20	pH 8.1 O2 ppm 8.9 Cond. 394 Temp(C) 20.0	20.0	20.0	21.0	8.2 8.5 424 21.0
10	pH 8.2 O2 ppm 8.6 Cond. 367 Temp(C) 20.0	20.0	20.0	21.0	8.2 8.6 396 21.0
Control	pH 8.2 O2 ppm 8.9 Cond. 343 Temp(C) 20.0	20.0	20.0	21.0	8.2 8.6 367 21.0

TOXICITY TEST REPORT Sample: 06890225

TEST CONDITIONS

Company : Petro-Canada Inc.  
 : Mississauga, ONT  
 : (130104)  
 Region : Central  
 Industry : Petroleum Refining  
 Control point : cooling water-trap 1, (300)  
 Laboratory : Beak  
 Sampling Method : grab  
 Sampled By : Tom Tubello  
 Date Collected : 02/27/89  
 Received : 02/27/89  
 Tested : 02/28/89 at: 1130

Type of Bioassay : STATIC  
 (Daphnia magna Acute Lethality Toxicity  
 Test Protocol. OME, 1988)

Test Animal : D. magna  
 Weight(gm) :  
 Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 24:00 48:00	%
100	0 0 0	0
50	0 0 0	0
30	0 0 0	0
20	0 0 0	0
10	0 0 0	0
Control	0 0 0	0

48 Hour LC50 : Non-lethal  
 95% fid. limits : 0.0 - 0.0 %  
 Comments : 5 % circling at the end of exposure

## TOXICITY TEST PARAMETERS

Sample Number: 06890225

TEST CONC.  
%  
ELAPSED TIME  
00:00 24:00 48:00

100	pH 8.1 O2 ppm 9.0 Cond. 350 Temp(C) 20.0	20.0	20.0	21.0
50	pH 7.9 O2 ppm 9.4 Cond. 350 Temp(C) 20.0	20.0	20.0	21.0
30	pH 7.9 O2 ppm 9.5 Cond. 350 Temp(C) 20.0	20.0	20.0	21.0
20	pH 7.9 O2 ppm 9.5 Cond. 352 Temp(C) 20.0	20.0	20.0	21.0
10	pH 7.9 O2 ppm 9.6 Cond. 353 Temp(C) 20.0	20.0	20.0	21.0
Control	pH 7.9 O2 ppm 9.6 Cond. 359 Temp(C) 20.0	20.0	20.0	21.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :  
LC50 Calculated By : moving average

TOXICITY TEST REPORT Sample: 06890524

## TOXICITY TEST PARAMETERS

## TEST CONDITIONS

Company : Petro-Canada Inc.  
Mississauga, ONT  
(130104)  
Region : Central  
Industry : Petroleum Refining  
Control point : cooling water-trap 1, (300)  
Laboratory : Beak  
Sampling Method : grab  
Sampled By : Karen Gregory  
Date Collected : 05/09/89  
Received : 05/09/89  
Tested : 05/09/89 at: 1400  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, ONE, 1988)  
Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E		TOTAL MORTALITY
%	00:00	24:00 48:00	%
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed in 48 Hrs

Sample Number: 06890524

TEST E L A P S E D T I M E  
CONC. % 00:00 24:00 48:00

100	pH 8.4 O2 ppm 10.2 Cond. 331 Temp(C) 20.0	8.4 8.4 314 20.0	8.0 8.4 314 20.0
50	pH 8.4 O2 ppm 9.8 Cond. 327 Temp(C) 20.0	8.4 8.3 309 20.0	8.3 8.3 309 20.0
30	pH 8.4 O2 ppm 9.2 Cond. 342 Temp(C) 20.0	8.4 8.2 311 20.0	8.3 8.4 311 20.0
20	pH 8.4 O2 ppm 8.3 Cond. 365 Temp(C) 20.0	8.4 8.3 322 20.0	8.3 9.2 322 20.0
10	pH 8.4 O2 ppm 8.7 Cond. 339 Temp(C) 20.0	8.4 8.7 311 20.0	8.2 9.1 311 20.0
Control	pH 8.4 O2 ppm 8.8 Cond. 323 Temp(C) 20.0	8.4 8.8 300 20.0	8.1 8.0 300 20.0

SLOPE of Mortality Curve : moving average  
 LC50 Calculated By :

Sample: 06890226

## TOXICITY TEST REPORT

TEST CONDITIONS

Company : Petro-Canada Inc.  
 (130104)  
 Region : Central  
 Industry : Petroleum Refining  
 Control point : cooling water-trap 3, (500)  
 Laboratory : Beak  
 Sampling Method : grab  
 Sampled By : Tom Tubello  
 Date Collected : 02/27/89  
 Received : 02/27/89  
 Tested : 02/28/89 at: 1300  
 Type of Bioassay : STATIC  
 (Daphnia magna Acute Lethality Toxicity  
 Test Protocol: ONE, 1988)  
 Test Animal : D. magna  
 Weight(gm) :  
 Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	24:00 48:00	%
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : 70 % of Daphnia floating at the end of expos.

## TOXICITY TEST PARAMETERS

Sample Number: 06890226

TEST CONC. %  
 ELAPSED TIME  
 00:00 24:00 48:00

100	pH 8.3 O2 ppm 8.5 Cond. 474 Temp(C) 20.0	20.0	20.0	21.0
50	pH 8.1 O2 ppm 8.9 Cond. 403 Temp(C) 20.0	20.0	20.0	21.0
30	pH 8.0 O2 ppm 9.5 Cond. 382 Temp(C) 20.0	20.0	20.0	21.0
20	pH 7.9 O2 ppm 9.5 Cond. 373 Temp(C) 20.0	20.0	20.0	21.0
10	pH 7.7 O2 ppm 9.5 Cond. 374 Temp(C) 20.0	20.0	20.0	21.0
Control	pH 7.7 O2 ppm 8.5 Cond. 355 Temp(C) 20.0	20.0	20.0	21.0

## MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 06890526

TEST CONDITIONS

Company : Petro-Canada Inc.  
 (130104)  
 Region : Central  
 Industry : Petroleum Refining  
 Control point : cooling water-trap 3, (500)  
 Laboratory : Beak  
 Sampling Method : grab  
 Sampled By : Karen Gregory  
 Date Collected : 05/09/89  
 Received : 05/09/89  
 Tested : 05/09/89 at: 1100

Type of Bioassay : STATIC.  
 (Daphnia magna Acute Lethality Toxicity  
 Test Protocol, OME, 1988)

Test Animal : D. magna  
 Weight(gm) :  
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E		TOTAL MORTALITY
%	00:00	24:00	48:00
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal  
 95% fid. limits : 0.0 - 0.0 %  
 Comments : no mortality or immobility observed in 48 Hrs

SLOPE of Mortality Curve :  
 LC50 Calculated By : moving average

## TOXICITY TEST PARAMETERS

Sample Number: 06890526

TEST CONC. %	E L A P S E D T I M E	
	00:00	24:00 48:00
100	pH 8.7 O2 ppm 9.2 Cond. 366 Temp(C) 20.0	8.1 8.5 366 20.0
50	pH 8.6 O2 ppm 8.6 Cond. 347 Temp(C) 20.0	8.0 8.4 339 20.0
30	pH 8.5 O2 ppm 8.6 Cond. 337 Temp(C) 20.0	8.0 8.3 328 20.0
20	pH 8.4 O2 ppm 8.6 Cond. 331 Temp(C) 20.0	8.0 8.3 324 20.0
10	pH 8.4 O2 ppm 8.5 Cond. 326 Temp(C) 20.0	8.0 8.3 313 20.0
Control	pH 8.3 O2 ppm 9.0 Cond. 319 Temp(C) 20.0	8.0 8.2 310 20.0

SLOPE of Mortality Curve :  
LC50 Calculated By : moving average

Sample: 06890209

## TOXICITY TEST REPORT

## TEST CONDITIONS

Company : Petro-Canada Inc.  
Mississauga, ONT  
(130104)  
Region : Central  
Industry : Petroleum Refining  
Control point : intake water, (600)  
Laboratory : Beak  
Sampling Method : Beak  
Sampled By : Tom Tubello  
Date Collected : 02/07/89  
Received : 02/07/89  
Tested : 02/07/89 at: 1445

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol. OME, 1988)

Test Animal :  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	24:00	48:00
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments : no mortality observed during testing

## TOXICITY TEST PARAMETERS

Sample Number: 06890209

TEST CONC.  
% ELAPSED TIME  
00:00 24:00 48:00

100	pH 8.0 O2 ppm 9.8 Cond. 332 Temp(C) 20.0	20.0	20.0	48:00
50	pH 8.1 O2 ppm 9.7 Cond. 340 Temp(C) 20.0	20.0	20.0	48:00
30	pH 8.1 O2 ppm 9.0 Cond. 347 Temp(C) 20.0	20.0	20.0	48:00
20	pH 8.1 O2 ppm 8.7 Cond. 349 Temp(C) 20.0	20.0	20.0	48:00
10	pH 8.1 O2 ppm 8.7 Cond. 353 Temp(C) 20.0	20.0	20.0	48:00
Control	pH 8.0 O2 ppm 8.6 Cond. 351 Temp(C) 20.0	20.0	20.0	48:00



COMPANY: Petro-Canada Inc., Oakville  
(530006)  
(now with Trafalgar Refinery)  
SECTOR: Petroleum Refining  
REGION: Central

#### SUMMARY

The data for six trout bioassays, conducted on process effluent samples between December 1988 and May 1989, were provided by Petro-Canada Incorporated. Two of the process effluent samples were determined to have been acutely lethal to the test fish. Statistically, the percentage effluent required to kill 50 % of the test fish by the end of the four days exposure were 76.4 % (December) and 71.0 % (March). The other four samples were determined to have been non-acutely lethal.

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#### Process Effluent

06881223 sampled: 12/13/88 LC50: 76.4 %  
95% fid. limits: 74.0 - 78.7 %  
comments:

06890112 sampled: 01/17/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

06890217 sampled: 02/21/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

06890335 sampled: 03/21/89 LC50: 71.0 %  
95% fid. limits: 50.0 - 100.0 %  
comments: fish mort. occurred within 24 Hrs of exposure

06890424 sampled: 04/11/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or sublethal impairment observed

01890072 sampled: 05/03/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA audit sample.

06890539 sampled: 05/16/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or sublethal impairment in 96Hrs

Petro-Canada Inc. (continued)

EO-sheet pond

intake water

storm water

TOXICITY TEST REPORT      Sample: 06881223

### TEST CONDITIONS

Company	Petro-Canada Inc.
Address	One Williamstown Rd., Ottawa, Ont. K1G 3H6
Region	Central
Industry	Petroleum Refining
Control point	Process Effluent, (100)
Laboratory	Beak
Sampling Method	24hr. Comp.
Sampled By	Petro Canada
Date	12/13/88
Received	12/13/88
Tested	12/13/88 at: 400

Type of Bioassay : STATIC (Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

(200) 416-6667  
(200) 416-6667  
(200) 416-6667

7140 ALLIANCE

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
	%	00:00	24:00	48:00	72:00	
100		0	0	4	7	9
50		0	0	0	0	0
50		0	0	0	0	0
50		0	0	0	0	1
50		0	0	0	0	0
Control		0	0	0	0	0

96 4032 LC50	: 76.4 %
98 614 11118	: 74.0 - 78.7 %

1. *Adf.*

## TOXICITY TEST PARAMETERS

Sample Number: 06881223

TEST CONC. %	ELAPSED TIME
	00:00 24:00 48:00 72:00 96:00

100	pH	8.3	8.3	8.3	8.3	8.6
	O2 ppm	8.2	8.6	8.4	7.2	1877
	Cond.	1820				
	Temp(C)	14.0	15.0	15.0	15.0	15.0
50	pH	8.1	8.2	8.4	8.3	8.4
	O2 ppm	8.2	9.2	8.6	8.6	9.2
	Cond.	1165				1133
	Temp(C)	14.0	15.0	15.0	15.0	15.0
30	pH	8.0	8.3	8.4	8.3	8.4
	O2 ppm	9.4	9.6	9.8	9.4	10.0
	Cond.	851				834
	Temp(C)	14.0	15.0	15.0	15.0	15.0
20	pH	7.9	8.2	8.3	8.3	8.3
	O2 ppm	8.4	9.8	9.6	9.9	9.7
	Cond.	677				650
	Temp(C)	14.0	15.0	15.0	15.0	15.0
10	pH	7.7	8.1	8.1	8.0	8.2
	O2 ppm	8.2	8.2	8.2	8.3	8.2
	Cond.	509				480
	Temp(C)	14.0	15.0	15.0	15.0	15.0
Control	pH	7.9	8.2	8.3	8.1	8.3
	O2 ppm	9.3	10.4	9.4	9.4	9.9
	Cond.	317				336
	Temp(C)	15.0	15.0	15.0	15.0	15.0

## MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890112

## TEST CONDITIONS

Company : Petro-Canada Inc.  
 : Oakville, ONT  
 : (530006)  
 Region : Central  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (100)  
 Laboratory : Beak  
 Sampling Method : grab  
 Sampled By : Tom Tubello  
 Date Collected : 01/17/89  
 Received : 01/17/89  
 Tested : 01/17/89 at: 1600

Type of Bioassay : STATIC  
 (Protocol to determine the acute lethality  
 of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	1	10
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :  
 LC50 Calculated By : moving average

## TOXICITY TEST PARAMETERS

Sample Number: 06890112

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	9.0	8.4	8.4	8.3	8.3
	O2 ppm	8.6	8.8	9.0	9.2	9.2
	Cond.	2110				2120
	Temp(C)	15.0	15.0	15.0	15.0	15.0
50	pH	8.8	8.2	8.3	8.1	8.1
	O2 ppm	8.1	8.6	8.6	7.8	8.8
	Cond.	1280				1307
	Temp(C)	15.0	15.0	15.0	15.0	15.0
30	pH	8.5	8.2	8.2	8.2	8.3
	O2 ppm	8.6	9.4	8.8	8.8	10.0
	Cond.	905				935
	Temp(C)	15.0	15.0	15.0	15.0	15.0
20	pH	8.3	8.1	8.2	8.1	8.2
	O2 ppm	8.2	8.4	9.8	8.6	8.6
	Cond.	731				760
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	8.1	8.1	8.3	8.1	8.2
	O2 ppm	9.3	9.8	9.8	9.6	10.0
	Cond.	547				571
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	8.0	8.2	8.1	8.1	8.0
	O2 ppm	9.0	9.4	9.8	9.8	9.6
	Cond.	363				351
	Temp(C)	15.0	15.0	15.0	15.0	15.0

Sample: 06890217

TOXICITY TEST REPORT

TEST CONDITIONS

Company : Petro-Canada Inc.  
 : Oakville, ONT  
 : (530006)  
 Region : Central  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (100)  
 Laboratory : Beak  
 Sampling Method : grab  
 Sampled By : Steve Mo  
 Date Collected : 02/21/89  
 Received : 02/21/89  
 Tested : 02/21/89 at: 1700

Type of Bioassay

: STATIC  
 : (Protocol to determine the acute lethality  
 : of liquid effluents to fish. OME, 1983).

Test Animal  
 Weight(gm)  
 Length(cm)

: Rainbow trout  
 :  
 :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
30	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

% Near LC50 : Non-lethal  
 % fld. limite : 0.0 - 0.0 %

Comments

TOXICITY TEST PARAMETERS

Sample Number: 06890217

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00
100	pH 7.9 02 ppm 7.0 Cond. 1887 Temp(C) 15.0	8.0 8.6 9.4 15.0	8.1 9.4 14.0 15.0	8.1 9.4 14.0 15.0	8.0 10.4 1785 1087
50	pH 7.7 02 ppm 8.4 Cond. 1182 Temp(C) 15.0	8.1 8.9 9.8 15.0	8.1 9.8 14.0 15.0	8.1 9.9 14.0 15.0	8.1 10.8 1087 15.0
30	pH 7.7 02 ppm 8.5 Cond. 884 Temp(C) 15.0	7.8 8.8 9.5 15.0	8.1 10.3 14.0 15.0	8.1 10.3 14.0 15.0	8.1 10.8 819 15.0
20	pH 7.5 02 ppm 8.8 Cond. 720 Temp(C) 15.0	7.9 8.4 9.0 15.0	8.0 8.8 14.0 15.0	8.0 8.8 14.0 15.0	8.1 9.5 680 15.0
10	pH 7.3 02 ppm 8.8 Cond. 540 Temp(C) 15.0	7.3 7.8 9.8 15.0	8.1 9.8 14.0 15.0	8.1 9.9 14.0 15.0	8.1 531 15.0
Control	pH 7.4 02 ppm 8.2 Cond. 399 Temp(C) 15.0	7.8 8.8 8.4 15.0	7.9 9.0 14.0 15.0	8.0 9.5 14.0 15.0	8.0 411 15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :  
LC50 Calculated By : moving average

Sample: 06890335

## TOXICITY TEST REPORT

## TEST CONDITIONS

Company : Petro-Canada Inc.  
Oakville, ONT  
(530006)  
Region : Central  
Industry : Petroleum Refining  
Control point : Process Effluent, (100)  
Laboratory : Beak  
Sampling Method : Grab  
Sampling Date : 03/21/89  
Date Collected : 03/21/89  
Received : 03/21/89  
Tested : 03/21/89 at: 1500

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY %
%	00:00	24:00	48:00	72:00	96:00		%
100	0	10	10	10	10	100	100
50	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : 71.0 %

95% fid. limits : 50.0 - 100.0 %

Comments : fish mort. occurred within 24 hrs of exposure

## TOXICITY TEST PARAMETERS

Sample Number: 06890335

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH	8.4	8.1		
	O2 ppm	7.0	10.0		
	Cond.	2110			
	Temp(C)	15.0	14.0		
50	pH	7.9	8.0	8.1	8.3
	O2 ppm	8.6	10.2	9.0	7.9
	Cond.	1253			1202
	Temp(C)	15.0	14.0	15.0	14.0
30	pH	7.7	8.1	8.1	8.2
	O2 ppm	9.5	10.2	9.2	7.3
	Cond.	898			855
	Temp(C)	15.0	14.0	15.0	14.0
20	pH	7.6	7.9	8.0	8.1
	O2 ppm	9.4	9.3	8.6	7.9
	Cond.	730			695
	Temp(C)	15.0	14.0	15.0	14.0
10	pH	7.4	7.9	8.1	8.3
	O2 ppm	9.2	8.9	8.7	8.8
	Cond.	539			505
	Temp(C)	15.0	14.0	15.0	14.0
Control	pH	7.3	7.9	7.9	8.3
	O2 ppm	8.9	8.2	8.2	7.2
	Cond.	372			351
	Temp(C)	15.0	14.0	15.0	14.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :  
LC50 Calculated By : moving average

## TOXICITY TEST REPORT Sample: 06890424

## TEST CONDITIONS

Company : Petro-Canada Inc.  
Location : Oakville, ONT  
Region : (S30006)  
Industry : Control  
Control point : Petrochem Refining  
Laboratory : Process Effluent, (100)  
Sampling Method : Beak  
Sampled By : Grab  
Date Collected : Steven Mo  
Received : 04/11/89  
Tested : 04/11/89 at: 1500

## Type of Bioassay

: STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish, OME, 1983).

Test Animal :  
Weight(gm) :  
Length(mm) :

: Rainbow trout

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%	%
100	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

7d Mean LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

## TOXICITY TEST PARAMETERS

Sample Number: 06890424

TEST CONC. %  
E L A P S E D T I M E  
00:00 24:00 48:00 72:00 96:00

100	pH 8.4 O2 ppm 7.2 Cond. 1910 Temp(C) 15.0	8.2 8.9 9.1 14.0 14.0	8.2 9.1 9.3 14.0 14.0	8.3 9.2 1799 15.0	8.1 9.2 1799 15.0
50	pH 8.1 O2 ppm 7.9 Cond. 1249 Temp(C) 15.0	7.9 7.0 8.1 14.0 14.0	7.9 8.1 8.7 14.0 14.0	7.8 8.2 1182 15.0	7.8 8.2 1182 15.0
30	pH 8.0 O2 ppm 9.2 Cond. 874 Temp(C) 15.0	8.0 8.3 8.6 14.0 14.0	8.1 8.6 9.1 14.0 14.0	8.1 9.0 862 15.0	8.0 9.0 862 15.0
20	pH 8.1 O2 ppm 10.2 Cond. 731 Temp(C) 15.0	8.1 9.6 9.6 14.0 14.0	8.3 9.7 9.7 14.0 14.0	8.2 9.4 705 15.0	8.2 9.4 705 15.0
10	pH 7.8 O2 ppm 9.6 Cond. 564 Temp(C) 15.0	8.1 8.2 8.9 14.0 14.0	8.0 8.8 8.8 14.0 14.0	8.1 8.9 554 15.0	8.1 8.9 554 15.0
Control	pH 7.9 O2 ppm 9.2 Cond. 379 Temp(C) 15.0	7.8 8.0 8.6 14.0 14.0	8.0 8.6 8.8 14.0 14.0	8.0 8.6 366 15.0	7.9 8.6 366 15.0

## MISA-PETROLEUM-FISH

## TOXICITY TEST REPORT Sample: 01890072

## TEST CONDITIONS

Company : Petro-Canada Inc.  
 Oakville, ONT  
 (530006)  
 Region : Central  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (100)  
 Laboratory : MOE  
 Sampling Method : Grab  
 Sampled By : R. Gibson  
 Date Collected : 05/03/89  
 Received : 05/03/89  
 Tested : 05/04/89 at: 1100

## Type of Bioassay

: STATIC  
 (Protocol to determine the acute lethality  
 of liquid effluents to fish. OME, 1983).

Test Animal  
 Weight(gm)  
 Length(mm)

: Rainbow trout

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E							TOTAL MORTALITY	
%	00:00	00:30	01:00	02:00	04:00	22:00	48:00	72:00	96:00 %
100	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA audit sample.

SLOPE of Mortality Curve :  
 LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 01890072

TEST CONC. %	E L A P S E D T I M E								
	00:00	00:30	01:00	02:00	04:00	22:00	48:00	72:00	96:00
100	pH 8.4 O2 ppm 7.0 Cond. 1500 Temp(C) 15.0	8.1 9.1 1500 15.0				8.1 8.0 1600 15.0	7.9 9.6 1585 15.0	7.9 9.6 1585 15.0	7.9 9.6 155 15.0
65	pH 8.1 O2 ppm 9.2 Cond. 1100 Temp(C) 15.0	8.1 9.2 1100 15.0				8.1 8.0 1210 15.0	8.1 9.7 1190 15.0	8.1 9.6 117 15.0	8.1 9.6 117 15.0
40	pH 8.0 O2 ppm 9.0 Cond. 800 Temp(C) 15.0	8.0 9.0 745 15.0				8.0 8.0 800 15.0	8.0 9.6 775 15.0	8.0 9.7 770 15.0	8.0 9.7 75 15.0
30	pH 8.0 O2 ppm 9.3 Cond. 640 Temp(C) 15.0	8.0 9.3 640 15.0				8.0 9.5 640 15.0	7.8 9.7 620 15.0	7.8 9.7 625 15.0	7.8 9.7 61 15.0
20	pH 8.0 O2 ppm 9.5 Cond. 540 Temp(C) 15.0	8.0 9.5 495 15.0				8.0 9.7 540 15.0	7.7 9.7 530 15.0	7.7 9.7 530 15.0	7.7 9.7 51 15.0
10	pH 7.7 O2 ppm 9.5 Cond. 385 Temp(C) 15.0	7.7 9.5 385 15.0				7.7 9.6 400 15.0	7.8 9.6 400 15.0	7.8 9.6 400 15.0	7.8 9.6 39 15.0
Control	pH 7.4 O2 ppm 9.7 Cond. 260 Temp(C) 15.0	7.4 9.7 260 15.0				7.4 9.7 265 15.0	7.4 9.8 265 15.0	7.5 9.8 265 15.0	7.5 9.8 26 15.0

## TOXICITY TEST REPORT Sample: 06890539

## TEST CONDITIONS

Company : Petro-Canada Inc.  
 : Oakville, ONT  
 : (530006)  
 Region : Central  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (100)  
 Laboratory : Beak  
 Sampling Method : grab  
 Sampled By : Steven Mo  
 Date Collected : 05/16/89  
 Date Received : 05/16/89 at: 1130  
 Tested

Type of Bioassay : STATIC  
 : (Protocol to determine the acute lethality  
 : of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
 Weight(gm)  
 Length(mm)

## MORTALITY DATA

TEST CONC.	%	00:00	24:00	48:00	72:00	96:00	TOTAL MORTALITY	%
100	0	0	0	0	0	0	0	0
65	0	0	0	0	1	1	10	10
50	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-Lethal  
 95% fid. limits : 0.0 - 0.0 %  
 Comments : no mortality or sublethal impairment in 96Hrs

## TOXICITY TEST PARAMETERS

Sample Number: 06890539

TEST CONC. %	ELAPSED TIME	00:00	24:00	48:00	72:00	96:00
100	pH	8.1	8.4	2.0	8.2	8.2
	O2 ppm	7.1	9.0	8.1	8.4	8.4
	Cond.	1809				1883
	Temp(C)	14.0	15.0	15.0	15.0	15.0
65	pH	7.9	8.3	8.1	8.2	8.1
	O2 ppm	7.5	9.8	7.9	8.8	9.5
	Cond.	1243				1258
	Temp(C)	14.0	15.0	15.0	15.0	15.0
50	pH	7.9	8.3	8.2	8.2	8.1
	O2 ppm	7.9	9.8	9.7	9.0	8.9
	Cond.	1009				1202
	Temp(C)	14.0	15.0	15.0	15.0	15.0
30	pH	7.8	8.2	8.0	8.1	8.0
	O2 ppm	7.9	9.0	8.4	8.6	9.2
	Cond.	713				677
	Temp(C)	14.0	15.0	15.0	15.0	15.0
15	pH	7.9	8.2	8.1	8.1	7.9
	O2 ppm	8.6	8.4	8.8	9.2	8.3
	Cond.	568				490
	Temp(C)	14.0	15.0	15.0	15.0	15.0
5	pH	7.8	8.3	8.2	8.2	7.8
	O2 ppm	9.5	9.0	8.8	9.0	9.0
	Cond.	382				360
	Temp(C)	14.0	15.0	15.0	15.0	15.0
Control	pH	7.7	8.1	8.2	8.2	7.9
	O2 ppm	9.9	9.6	9.0	9.2	9.1
	Cond.	402				402
	Temp(C)	14.0	15.0	15.0	15.0	15.0



COMPANY: Petro-Canada Inc., Oakville  
(530006)  
(now with Trafalgar Refinery)  
SECTOR: Petroleum Refining  
REGION: Central

#### SUMMARY

Results for six Daphnia magna acute lethality toxicity tests conducted on samples of Process Effluent collected between December 1988 and May 1989 were submitted by Petro-Canada Inc. in Oakville. Three of the six samples were not toxic to Daphnia. Two samples were toxic to Daphnia with 48 h LC50 values of 31% and 41% effluent. One sample was mildly toxic with a 48 h LC50 > 100% effluent.

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#### Process Effluent

06881218 sampled: 12/13/88 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

06890115 sampled: 01/17/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

06890218 sampled: 02/21/89 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: 20 % mortality in undiluted sample

06890333 sampled: 03/21/89 LC50: 41.0 %  
95% fid. limits: 34.0 - 49.0 %  
comments: most mort. occurred within 24 Hrs of exposure

06890425 sampled: 04/11/89 LC50: 31.0 %  
95% fid. limits: 27.0 - 36.0 %  
comments: 10% Daphnia floating in 20% conc. at 48 Hrs

02890072 sampled: 05/03/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA Audit

06890540 sampled: 05/16/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or immobility observed in 48 Hrs

Petro-Canada Inc. (continued)

EO-sheet pond

intake water

storm water

SLOPE of Mortality Curve  
LC50 Calculated by :

Sample: 00861218

TEST CONDITIONS

Company : Petro-Canada Inc.  
Oakville, ON  
(530006)  
Region : Central  
Infectivity : Petro-Canada Refining  
Control Point : Process Effluent, (100)  
Laboratory : BLAF  
Sampling Method : 24hr. Comp  
Sampled By : Petro-Canada  
Date Collected : 12/13/88  
Received : 12/13/88  
Tested : 12/14/88 at: 1100

Type of Bioassay : STATIC  
Respirable Magna Krone Lethality Toxicity  
Test Protocol, GME, 1985

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

MORTALITY DATA

TEST	E L A P S E D T I M E		TOTAL MORTALITY	%
Flow	00:00	24:00 48:00		
100	0	0	0	0
50	0	0	0	0
20	0	0	0	0
10	0	0	0	0
Control	0	0	0	0

48 Hour LC50 : Non-Lethal  
95% Fid. Limits : 0.0 - 0.0 %  
Comments:

TOTALITY TEST PARAMETERS

Sample Number : 00861218  
TEST  
COND. :  
% :  
00:00 24:00 48:00

100	pH	8.2	8.2	8.2	7.9
	0.2 ppm	5.0	5.0	5.2	5.2
	Concl.	1950	1950	1950	1950
	Temp(C)	20.0	20.0	20.0	20.0
50	pH	8.1	8.1	8.0	8.0
	0.2 ppm	6.7	6.7	5.5	5.5
	Concl.	10668	10668	1403	1403
	Temp(C)	20.0	20.0	20.0	20.0
30	pH	8.1	8.1	8.1	8.1
	0.2 ppm	6.2	6.2	6.2	6.2
	Concl.	815	815	867	867
	Temp(C)	20.0	20.0	20.0	20.0
20	pH	8.1	8.1	8.1	8.1
	0.2 ppm	6.7	6.7	6.5	6.5
	Concl.	655	655	701	701
	Temp(C)	20.0	20.0	20.0	20.0
10	pH	8.0	8.0	8.1	8.1
	0.2 ppm	7.1	7.1	6.5	6.5
	Concl.	489	489	517	517
	Temp(C)	20.0	20.0	20.0	20.0
Control	pH	8.2	8.2	7.6	7.6
	0.2 ppm	6.9	6.9	6.5	6.5
	Concl.	559	559	555	555
	Temp(C)	20.0	20.0	20.0	20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : moving average  
LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 06890115

TEST CONDITIONS

Company : Petro-Canada Inc.  
: Oakville, ONT  
(530006)  
Region : Central  
Industry : Petroleum Refining  
Control point : Process Effluent, (100)  
Laboratory : Beak  
Sampling Method : grab  
Sampled By : Tom Tubello  
Date Collected : 01/17/89  
Received : 01/17/89  
Tested : 01/17/89 at: 1300

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, OME, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E		TOTAL MORTALITY
%	00:00	24:00	48:00
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 06890115

TEST CONC. %  
E L A P S E D T I M E  
00:00 24:00 48:00

100	pH 8.5	8.2
	O2 ppm 8.9	7.4
	Cond. 2230	2240
	Temp(C) 20.0	20.0
50	pH 8.4	8.1
	O2 ppm 9.1	8.0
	Cond. 1285	1328
	Temp(C) 20.0	20.0
30	pH 8.3	8.1
	O2 ppm 9.2	8.5
	Cond. 932	967
	Temp(C) 20.0	20.0
20	pH 8.3	8.1
	O2 ppm 9.2	8.4
	Cond. 745	766
	Temp(C) 20.0	20.0
10	pH 8.2	8.2
	O2 ppm 9.1	8.4
	Cond. 547	565
	Temp(C) 20.0	20.0
Control	pH 8.2	8.1
	O2 ppm 9.1	8.5
	Cond. 407	432
	Temp(C) 20.0	20.0

## TOXICITY TEST REPORT Sample: 06890218

TEST CONDITIONS

Company : Petro-Canada Inc.  
 : Oakville, ONT  
 : (530066)  
 Region : Central  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (100)  
 Laboratory : Beek  
 Sampling Method : grab  
 Sampled By : Steve Mo  
 Date Collected : 02/21/89  
 Received : 02/21/89  
 Tested : 02/21/89 at: 1500  
 Type of Bioassay : STATIC  
 : (Daphnia magna Acute Lethality Toxicity  
 : Test Protocol. ONE, 1988)  
 : D. magna  
 :  
 :  
 Test Animal  
 Weight(gm)  
 Length(mm)

MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	24:00	48:00
100	0	0	20
50	0	2	20
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : &gt;100%

95% fid. limits : 0.0 - 0.0 %

Comments : 20 % mortality in undiluted sample

## TOXICITY TEST PARAMETERS

Sample Number: 06890218

TEST CONC. %  
 ELAPSED TIME  
 00:00 24:00 48:00

100	pH 8.0 O2 ppm 6.0 Cond. 1730 Temp(C) 20.0	8.0 6.2 1924 20.0	7.8 6.2 1924 21.0
50	pH 8.0 O2 ppm 8.0 Cond. 1086 Temp(C) 20.0	8.0 7.9 1163 20.0	7.9 7.9 1163 21.0
30	pH 7.9 O2 ppm 8.0 Cond. 775 Temp(C) 20.0	8.0 8.1 820 20.0	8.0 8.1 820 21.0
20	pH 7.9 O2 ppm 8.1 Cond. 691 Temp(C) 20.0	8.0 8.4 723 20.0	8.0 8.4 723 21.0
10	pH 8.0 O2 ppm 8.1 Cond. 544 Temp(C) 20.0	8.0 8.7 537 20.0	8.0 8.7 537 21.0
Control	pH 8.1 O2 ppm 7.7 Cond. 371 Temp(C) 20.0	8.1 7.7 345 20.0	7.9 10.0 345 21.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :  
LC50 Calculated By : moving average

## TOXICITY TEST REPORT Sample: 06890333

## TEST CONDITIONS

Company : Petro-Canada Inc.  
Oakville, ONT  
(530006)  
Region : Central  
Industry : Petroleum Refining  
Control point : Process Effluent, (100)  
Laboratory : Beak  
Sampling Method : grab  
Sample No : 03/21/89  
Date Collected : 03/21/89  
Date Received : 03/21/89  
Date Tested : 03/21/89 at: 1730

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol. ONE, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E				TOTAL MORTALITY
%	00:00 24:00 48:00				%
100	0	10	10	10	100
50	0	1	9	10	90
30	0	0	1	10	10
20	0	0	1	10	10
10	0	0	0	0	0
Control	0	0	0	0	0

48 Hour LC50 : 41.0 %

95% fid. limits : 34.0 - 49.0 %

Comments : most mort. occurred within 24 Hrs of exposure

## TOXICITY TEST PARAMETERS

Sample Number: 06890333

TEST CONC. %  
E L A P S E D T I M E  
00:00 24:00 48:00

100	pH 8.5	O2 ppm 6.4	Cond. 2210	Temp(C) 20.0	20.0	21.0	7.7
50	pH 8.5	O2 ppm 7.8	Cond. 1344	Temp(C) 20.0	20.0	21.0	7.8
30	pH 8.4	O2 ppm 7.9	Cond. 981	Temp(C) 20.0	20.0	21.0	7.8
20	pH 8.4	O2 ppm 8.3	Cond. 804	Temp(C) 20.0	20.0	21.0	8.0
10	pH 8.3	O2 ppm 8.8	Cond. 608	Temp(C) 20.0	20.0	21.0	8.1
Control	pH 8.2	O2 ppm 8.9	Cond. 418	Temp(C) 20.0	20.0	21.0	8.3

Sample: 06890425

## TOXICITY TEST REPORT

## TEST CONDITIONS

Company : Petro-Canada Inc.  
Oakville, ONT  
(530006)  
Region : Central  
Industry : Petroleum Refining  
Control Policy : Process Effluent, (100)  
Laboratory : Beak  
Sampling Method : grab  
Sampled By : Steven Mo  
Date Collected : 04/11/89  
Received : 04/11/89  
Tested : 04/11/89 at: 1530  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol: OME, 1988)  
: D. magna  
: :  
: :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	24:00 48:00	%
100	0	0	100
50	0	0	100
30	0	0	50
20	0	0	0
10	0	0	0
5	0	0	0
Control	0	0	0

48 Hour LC50 : 31.0 %

95% fid. limits : 27.0 - 36.0 %

Comments : 10% Daphnia floating in 20% conc. at 48 hrs

## TOXICITY TEST PARAMETERS

Sample Number: 06890425

TEST CONC.  
%  
ELAPSED TIME  
00:00 24:00 48:00

100	pH 8.2	O2 ppm 4.5	Cond. 2030	Temp(C) 20.0	8.1 8.6 1956 20.0
50	pH 8.2	O2 ppm 7.2	Cond. 1144	Temp(C) 20.0	8.2 8.6 1168 20.0
30	pH 8.2	O2 ppm 8.0	Cond. 837	Temp(C) 20.0	8.2 8.6 850 20.0
20	pH 8.2	O2 ppm 8.5	Cond. 675	Temp(C) 20.0	8.2 8.6 699 20.0
10	pH 8.2	O2 ppm 8.9	Cond. 533	Temp(C) 20.0	8.3 8.5 556 20.0
5	pH 8.2	O2 ppm 9.0	Cond. 467	Temp(C) 20.0	8.3 8.7 479 20.0
Control	pH 8.2	O2 ppm 9.0	Cond. 382	Temp(C) 20.0	8.2 8.4 391 20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
 LC50 calculated by :

## TOXICITY TEST REPORT Sample: 02890072

## TEST CONDITIONS

Company : Petro-Canada, Inc.  
 : Oakville, ONT  
 : (530006)  
 Region : Central  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (100)  
 Laboratory : MOE  
 : grab  
 Sampling Method : Raeburn-Gibson  
 Sampled By : 05/03/89  
 Date Collected : 05/03/89  
 Received : 05/04/89 at: 1130  
 Tested :  
 Type of Bioassay : STATIC  
 : (Daphnia magna Acute Lethality Toxicity  
 : Test Protocol, ONE, 1988)  
 Test Animal : D. magna  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	48:00 72:00	%
100	0	0	0
60	0	0	0
30	0	1	8
15	0	0	0
5	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA Audit

## TOXICITY TEST PARAMETERS

Sample Number: 02890072

TEST CONC. %

ELAPSED TIME

00:00 48:00 72:00

100	pH 8.2 O2 ppm 7.8 Cond. 1840 Temp(C) 20.0	8.2 7.1 1840 20.0
60	pH 8.2 O2 ppm 8.9 Cond. 1223 Temp(C) 20.0	8.1 8.0 1223 20.0
30	pH 8.1 O2 ppm 780 Cond. 785 Temp(C) 20.0	8.0 8.0 785 20.0
15	pH 8.1 O2 ppm 550 Cond. 565 Temp(C) 20.0	8.1 8.1 565 20.0
5	pH 8.0 O2 ppm 397 Cond. 401 Temp(C) 20.0	8.1 7.9 401 20.0
Control	pH 8.0 O2 ppm 340 Cond. 330 Temp(C) 20.0	8.1 8.3 330 20.0

## TOXICITY TEST REPORT Sample: 06890540

## TEST CONDITIONS

Company : Petro-Canada Inc.  
City : Oakville, ONT  
(L50006)  
Region : Central  
Industry : Petroleum Refining  
Control point : Process Effluent, (100)  
Laboratory : Beak  
Sampling Method : grab  
Sampled By : Steven Mo  
Date Collected : 05/16/89  
Date Received : 05/16/89  
Tested : 05/16/89 at: 1400  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, OME, 1988)  
Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E		TOTAL MORTALITY
%	00:00	24:00 48:00	%
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed in 48 Hrs

## TOXICITY TEST PARAMETERS

Sample Number: 06890540

TEST CONC.  
%  
E L A P S E D T I M E  
00:00 24:00 48:00

100	pH 02 ppm Cond. Temp(C)	8.0 3.7 2160 21.0	8.1 6.9 2310 21.0
50	pH 02 ppm Cond. Temp(C)	8.1 7.8 1326 21.0	8.2 8.0 1351 21.0
30	pH 02 ppm Cond. Temp(C)	8.1 7.6 971 21.0	8.2 7.9 1002 21.0
20	pH 02 ppm Cond. Temp(C)	8.2 8.0 777 21.0	8.2 8.0 795 21.0
10	pH 02 ppm Cond. Temp(C)	8.2 8.2 601 21.0	8.1 7.9 606 21.0
Control	pH 02 ppm Cond. Temp(C)	8.2 8.7 461 21.0	8.2 8.2 425 21.0



COMPANY: Petrosar Limited, Sarnia  
(480004)  
(now with Corunna Mfg. Complex)  
SECTOR: Petroleum Refining  
REGION: Southwest

#### SUMMARY

The data for six trout bioassays, conducted on process effluent samples collected between December 1988 and May 1989, were provided by Petrosar Limited. All six process effluent samples were determined to have been non-acutely lethal to test fish.

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intake water

#### Process Effluent

05880002 sampled: 12/12/88 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890001 sampled: 01/09/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890011 sampled: 02/06/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890022 sampled: 03/06/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890031 sampled: 04/03/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890036 sampled: 05/01/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

storm water

landfarm leachate

Petrosar Limited (continued)

emergency overflow

## TOXICITY TEST REPORT      Sample: 05880002

## TEST CONDITIONS

Company : Petrosar Limited  
              : Sudbury, ONT  
              : (L8000L)  
Region : Southeast  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : T. Moran  
Date Collected : 12/12/88  
Received : 12/12/88  
Tested : 12/13/88 at: 1130

## Type of Bioassay

: STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish, OME, 1983).

Test Animal : Rainbow Trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	%	00:00	02:10	03:10	05:00	22:25	46:25	70:00	95:10	%	TOTAL MORTALITY
100	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	1	2	3	3	30	30
56	0	0	0	0	0	0	1	1	1	10	10
25	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0	0

96 Hour LC50

N/A

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05880002

TEST CONC. %	E L A P S E D T I M E	00:00	02:10	03:10	05:00	22:25	46:25	70:00	95:10
100	pH 7.1 O2 ppm 10.2 Cond. 1600 Temp(C) 15.0	7.5 9.6 15.0	7.5 8.9 15.0	7.5 8.9 15.0	7.6 9.8 1700				
75	pH 7.1 O2 ppm 10.3 Cond. 1325 Temp(C) 15.0	7.5 9.5 15.0	7.6 9.4 15.0	7.6 10.0 1400	7.6 9.8 15.0				
56	pH 7.1 O2 ppm 10.4 Cond. 1000 Temp(C) 15.0	7.5 9.4 15.0	7.6 9.6 15.0	7.6 10.1 1050	7.6 9.8 15.0				
25	pH 7.1 O2 ppm 10.4 Cond. 550 Temp(C) 15.0	7.5 9.4 15.0	7.6 9.8 15.0	7.6 10.1 590	7.7 9.8 15.0				
10	pH 7.1 O2 ppm 10.5 Cond. 312 Temp(C) 13.0	7.5 9.3 15.0	7.7 9.7 15.0	7.7 10.1 320	7.7 10.1 15.0				
1	pH 7.2 O2 ppm 10.2 Cond. 180 Temp(C) 15.0	7.4 9.4 15.0	7.7 9.8 15.0	7.6 10.1 182	7.7 10.0 15.0				
Control	pH 7.0 O2 ppm 10.2 Cond. 162 Temp(C) 15.0	7.6 10.0 15.0	7.7 10.0 15.0	7.6 10.1 168	7.6 10.1 15.0				
Control	pH 7.1 O2 ppm 10.3 Cond. 162 Temp(C) 15.0	7.6 9.9 15.0	7.6 10.1 15.0	7.6 10.1 168	7.6 10.1 15.0				

## HISA-PETROLEUM-FISH

SLOPE of Mortality Curve :  
LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 05890001

## TEST CONDITIONS

Company : Petrosar Limited  
Sarnia, ONT  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : T. Moran  
Date Collected : 01/09/89  
Received : 01/09/89  
Tested : 01/12/89 at: 1130

## Type of Bioassay

: STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. OME, 1983).

Test Animal  
Weight(gm)  
Length(mm)

: Rainbow trout  
:  
:

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY
%	00:00	23:00	47:10	71:10	96:10	%	%
100	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890001

TEST CONC. %  
E L A P S E D T I M E  
00:00 23:00 47:10 71:10 96:10

100	pH 02 ppm Cond. Temp(C)	7.3 9.4 1990 15.0	7.6 9.5 15.0	7.6 10.4 15.0	7.6 9.9 15.0	7.6 9.8 1960
75	pH 02 ppm Cond. Temp(C)	7.5 9.3 1450 15.0	7.6 9.5 15.0	7.6 10.3 15.0	7.6 10.0 15.0	7.6 9.8 1420
56	pH 02 ppm Cond. Temp(C)	7.5 9.6 1220 15.0	7.7 9.8 15.0	7.6 10.2 15.0	7.6 10.2 15.0	7.7 10.0 1200
25	pH 02 ppm Cond. Temp(C)	7.7 10.4 680 15.0	7.7 10.0 15.0	7.7 10.2 15.0	7.7 10.2 15.0	7.7 10.0 600
10	pH 02 ppm Cond. Temp(C)	7.7 10.4 350 15.0	7.7 10.3 15.0	7.7 10.2 15.0	7.7 10.1 15.0	7.8 10.2 374
1	pH 02 ppm Cond. Temp(C)	7.7 10.4 185 15.0	7.7 10.4 15.0	7.7 10.2 15.0	7.9 10.2 15.0	7.9 10.2 188
Control	pH 02 ppm Cond. Temp(C)	7.7 10.4 165 15.0	7.6 10.3 15.0	7.6 10.2 15.0	7.7 10.0 15.0	7.7 10.0 164
Control	pH 02 ppm Cond. Temp(C)	7.8 10.6 165 15.0	7.7 10.2 15.0	7.7 10.1 15.0	7.8 9.9 15.0	7.7 10.2 164

## TOXICITY TEST REPORT Sample: 05890011

## TEST CONDITIONS

Company : Petrosar Limited  
Sarnia, ONT  
(480004)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : J. Ferguson  
Date Collected : 02/06/89  
Received : 02/06/89  
Tested : 02/07/89 at: 1620

Type of Bioassay : STATIC  
: (Protocol to determine the acute lethality  
of liquid effluents to fish, ONE, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST TIME	ELAPSED TIME					TOTAL MORTALITY
%	00:10	21:20	45:10	70:20	95:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890011

TEST ELAPSED TIME  
CONC. % 00:10 21:20 45:10 70:20 95:10

100	pH 02 ppm Cond. Temp(C)	7.1 9.6 2000 15.0	7.5 9.5 15.0	7.5 9.8 15.0	7.5 9.4 15.0	7.5 9.3 2050 15.0
75	pH 02 ppm Cond. Temp(C)	7.2 9.6 1600 15.0	7.6 9.5 15.0	7.5 9.4 15.0	7.5 9.3 1590 15.0	7.5 9.5 1590 15.0
56	pH 02 ppm Cond. Temp(C)	7.3 10.0 1200 15.0	7.6 9.5 15.0	7.5 9.4 15.0	7.5 9.3 1220 15.0	7.5 9.3 1220 15.0
25	pH 02 ppm Cond. Temp(C)	7.4 10.4 650 15.0	7.8 9.7 15.0	7.6 9.6 15.0	7.6 9.4 15.0	7.5 9.5 650 15.0
10	pH 02 ppm Cond. Temp(C)	7.5 10.4 330 15.0	7.7 9.5 15.0	7.5 9.4 15.0	7.5 9.5 348 15.0	7.6 9.5 348 15.0
1	pH 02 ppm Cond. Temp(C)	7.4 10.4 180 15.0	7.9 9.8 15.0	7.5 9.2 15.0	7.6 9.6 192 15.0	7.6 9.6 192 15.0
Control	pH 02 ppm Cond. Temp(C)	7.3 10.8 162 15.0	7.7 9.8 15.0	7.5 9.9 15.0	7.6 10.0 15.0	7.6 9.7 172 15.0
Control	pH 02 ppm Cond. Temp(C)	7.3 11.0 162 15.0	7.6 9.8 15.0	7.4 9.8 15.0	7.5 9.9 15.0	7.6 9.7 172 15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none  
 LC50 Calculated By :

## TOXICITY TEST REPORT

Sample: 05890022

## TEST CONDITIONS

Company : Petrosar Limited  
 Sarnia, ONT  
 (480004)  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (200)  
 Laboratory : pollutech  
 Sampling Method : Grab  
 Sampled By : C. Ferguson  
 Date Collected : 03/06/89  
 Received : 03/06/89  
 Tested : 03/07/89 at: 1520

## Type of Bioassay

: STATIC  
 (Protocol to determine the acute lethality  
 of liquid effluents to fish. ONE, 1983).

Test Animal  
 Weight(gm)  
 Length(mm)

: Rainbow trout  
 :  
 :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY
%	00:00	20:10	49:20	68:10	95:10	%	%
100	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890022

TEST CONC. %	E L A P S E D T I M E					
	00:00	20:10	49:20	68:10	95:10	
100	pH	7.2	7.2	7.2	7.3	7.3
	O2 ppm	8.4	8.4	8.8	9.8	9.3
	Cond.	2200				2220
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.3	7.1	7.2	7.3	7.4
	O2 ppm	9.9	6.4	9.2	9.8	9.4
	Cond.	1770				1790
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.3	7.4	7.3	7.5	7.6
	O2 ppm	9.2	9.0	9.4	10.0	9.4
	Cond.	900				900
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.5	7.5	7.4	7.6	7.6
	O2 ppm	9.5	9.6	9.2	10.0	9.9
	Cond.	780				800
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.5	7.5	7.3	7.6	7.5
	O2 ppm	9.5	9.4	9.0	9.8	10.2
	Cond.	390				410
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.5	7.6	7.4	7.5	7.5
	O2 ppm	9.7	9.4	9.4	9.8	10.0
	Cond.	189				198
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.5	7.6	7.5	7.7
	O2 ppm	10.0	9.8	10.1	10.2	10.2
	Cond.	168				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.5	7.6	7.6	7.7
	O2 ppm	9.9	9.6	9.8	10.2	10.3
	Cond.	168				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0

SLOPE of Mortality Curve : none  
 LC50 Calculated By :

# TOXICITY TEST REPORT Sample: 05890031

## TEST CONDITIONS

Company : Petrosar Limited  
 (480004)  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (200)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : C. Ferguson  
 Date Collected : 04/03/89  
 Received : 04/03/89  
 Tested : 04/04/89 at: 1330

## Type of Bioassay

: STATIC  
 (critical to determine the acute lethality  
 of liquid effluents to fish. OHE, 1983).

Test Animal  
 Weight(gm)  
 Length(mm)

: 5ml fish trout  
 :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 19:15 46:10 69:00 95:10	%
100	0 0 0 0 0	0
100	0 0 0 0 0	0
Control	0 0 0 0 0	0
Control	0 0 0 0 0	0

% Hour LC50 : Non-lethal  
 95% fid. limits : 0.0 - 0.0 %

Comments:

# TOXICITY TEST PARAMETERS

Sample Number: 05890031

TEST  
CONC.  
%

ELAPSED TIME

00:00 19:15 46:10 69:00 95:10

100	pH 7.2 02 ppm 8.3 Cond. 1710 Temp(C) 15.0	7.4 7.4 8.6 9.3 15.0	7.4 7.4 9.1 15.0	7.6 9.3 1710 15.0
100	pH 7.2 02 ppm 8.4 Cond. 1710 Temp(C) 15.0	7.6 7.6 9.4 9.4 15.0	7.5 7.5 8.9 15.0	7.6 9.4 1710 15.0
Control	pH 7.6 02 ppm 10.2 Cond. 162 Temp(C) 15.0	7.3 7.3 9.2 10.1 15.0	7.3 9.9 15.0	7.5 10.0 172 15.0
Control	pH 7.6 02 ppm 10.2 Cond. 162 Temp(C) 15.0	7.4 7.4 9.2 10.2 15.0	7.4 10.0 15.0	7.5 170 15.0

## MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890036

## TEST CONDITIONS

Company : Petrosar Limited  
Sarnia, ONT  
(480004)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : C. Ferguson  
Date Collected : 05/01/89  
Received : 05/01/89  
Tested : 05/02/89 at: 1400

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME						TOTAL MORTALITY
%	00:00	21:30	47:30	72:30	97:30		%
100	0	0	0	0	0		0
100	0	0	0	0	0		0
Control	0	0	0	0	0		0
Control	0	0	0	0	0		0

96 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments :

SLOPE of Mortality Curve : none  
LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 05890036

TEST  
CONC.  
%

ELAPSED TIME

00:00 21:30 47:30 72:30 97:30

100 pH 7.1 7.1 7.2 7.2 7.1  
02 ppm 8.8 8.9 8.2 9.3 9.4  
Conc. 2100 2100  
Temp(C) 15.0 15.0 15.0 15.0 15.0

100 pH 7.1 7.1 7.1 7.2 7.1  
02 ppm 8.8 9.6 8.6 9.2 9.5  
Conc. 2080 2110  
Temp(C) 15.0 15.0 15.0 15.0 15.0

Control pH 7.3 7.6 7.6 7.6 7.3  
02 ppm 10.6 9.8 9.3 9.8 10.0  
Conc. 158 172  
Temp(C) 15.0 15.0 15.0 15.0 15.0

Control pH 7.3 7.6 7.6 7.5 7.0  
02 ppm 10.4 10.0 9.4 9.9 10.1  
Conc. 158 170  
Temp(C) 15.0 15.0 15.0 15.0 15.0

COMPANY: Petrosar Limited, Sarnia  
(480004)  
(now with Corunna Mfg. Complex)  
SECTOR: Petroleum Refining  
REGION: Southwest

#### SUMMARY

The data for six Daphnia magna toxicity tests conducted on samples of Process Effluent collected between December 1988 and May 1989 were supplied by Petrosar Ltd. in Sarnia. All six samples were not acutely lethal to Daphnia magna.

---

intake water

#### Process Effluent

05880002 sampled: 12/12/88 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890001 sampled: 01/09/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890011 sampled: 02/06/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890022 sampled: 03/06/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890031 sampled: 04/03/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890036 sampled: 05/01/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

storm water

landfarm leachate

Petrosar Limited (continued)

emergency overflow

SLOPE of Mortality Curve :  
LC50 Calculated By :

Sample: 05880002

TOXICITY TEST REPORT

## TEST CONDITIONS

Company : Petrosas Limited  
Address : 480004, Otr  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : T. Moran  
Date Collected : 12/12/88  
Received : 12/12/88  
Tested : 12/13/88 at: 1150

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol. OME, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 48:00	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05880002

TEST ELAPSED TIME  
CONC. % 00:00 48:00

100	pH 7.4 7.5 O2 ppm 9.1 9.1 Cond. 1820 1820 Temp(C) 20.0 20.0
50	pH 7.9 7.7 O2 ppm 9.1 9.0 Cond. 1060 1200 Temp(C) 20.0 20.0
26	pH 8.0 8.0 O2 ppm 9.1 9.0 Cond. 940 930 Temp(C) 20.0 20.0
13	pH 8.1 8.1 O2 ppm 9.1 9.2 Cond. 780 780 Temp(C) 20.0 20.0
6	pH 8.1 8.0 O2 ppm 9.1 9.2 Cond. 680 690 Temp(C) 20.0 20.0
Control	pH 8.2 8.1 O2 ppm 9.0 9.0 Cond. 600 600 Temp(C) 20.0 20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :  
LC50 Calculated By :

TOXICITY TEST REPORT      Sample: 05890001

## TOXICITY TEST PARAMETERS

## TEST CONDITIONS

Company : Petrosar Limited  
 : Singapore  
 : (680004)  
 Region : Southeast  
 : Petroleum Refining  
 Industry :  
 Control point : Process Effluent, (200)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : T.Moran  
 Date Collected : 01/09/89  
 Received : 01/09/89  
 Tested : 01/09/89 at: 1400

Type of Bioassay : STATIC  
 : (Protocol to determine the acute lethality  
 : of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	%	E L A P S E D	T I M E	TOTAL MORTALITY	%
100	0	0	0	0	0
50	0	0	0	0	0
25	0	0	0	0	8
13	0	0	0	0	0
6	0	0	0	0	0
Control	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

Sample Number: 05890001

TEST CONC. %

E L A P S E D T I M E

00:00 47:30

100	pH 7.0 7.5 02 ppm 9.5 8.2 Cond. 2290 2200 Temp(C) 20.0 20.0
50	pH 7.5 7.8 02 ppm 9.5 9.2 Cond. 1450 1400 Temp(C) 20.0 20.0
26	pH 8.0 7.9 02 ppm 9.4 9.5 Cond. 1050 1020 Temp(C) 20.0 20.0
13	pH 8.1 8.1 02 ppm 9.5 9.5 Cond. 800 800 Temp(C) 20.0 20.0
6	pH 8.1 8.1 02 ppm 9.5 9.5 Cond. 700 700 Temp(C) 20.0 20.0
Control	pH 8.2 8.0 02 ppm 9.4 9.5 Cond. 590 600 Temp(C) 20.0 20.0

SLOPE of Mortality Curve : none  
LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 05890011

## TEST CONDITIONS

Company : Petrostar Limited  
Sarnia, ONT  
(480004)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : C. Ferguson  
Date Collected : 02/06/89  
Received : 02/06/89  
Tested : 02/07/89 at: 1520

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol. ONE, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	01:20 46:25	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890011

TEST CONC.  
% ELAPSED TIME  
01:20 46:25

100	pH 7.2 7.5 O2 ppm 9.2 8.6 Cond. 2260 2390 Temp(C) 20.0 20.0
50	pH 7.7 7.8 O2 ppm 9.2 8.9 Cond. 1480 1510 Temp(C) 20.0 20.0
26	pH 7.9 7.9 O2 ppm 9.0 9.0 Cond. 1080 1100 Temp(C) 20.0 20.0
13	pH 7.9 8.0 O2 ppm 9.0 9.0 Cond. 860 890 Temp(C) 20.0 20.0
6	pH 8.0 8.0 O2 ppm 9.0 9.2 Cond. 740 750 Temp(C) 20.0 20.0
Control	pH 8.0 7.9 O2 ppm 9.2 9.2 Cond. 620 650 Temp(C) 20.0 20.0

## MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890022

TEST CONDITIONS

Company : Petrosar Limited  
Sarnia, ONT  
(480004)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : C. Ferguson  
Date Collected : 03/06/89  
Received : 03/06/89  
Tested : 03/07/89 at: 1130

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, OME, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY %
%	00:00 48:25	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve : none  
LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 05890022

TEST CONC. %	ELAPSED TIME
	00:00 48:25

100	pH 7.3 O2 ppm 7.0 Cond. 8.6 Temp(C) 2480 2500 20.0 20.0
50	pH 7.8 O2 ppm 7.4 Cond. 8.5 Temp(C) 1510 1600 20.0 20.0
26	pH 7.9 O2 ppm 7.7 Cond. 8.6 Temp(C) 1110 1120 20.0 20.0
13	pH 8.0 O2 ppm 7.8 Cond. 8.8 Temp(C) 850 900 20.0 20.0
6	pH 8.0 O2 ppm 7.9 Cond. 8.9 Temp(C) 710 740 20.0 20.0
Control	pH 8.1 O2 ppm 9.1 Cond. 6.00 610 Temp(C) 20.0 20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
 LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 05890031

## TEST CONDITIONS

Company : Petrostar Limited  
 (480004)  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (200)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : C. Ferguson  
 Date Collected : 04/03/89  
 Received : 04/03/89  
 Tested : 04/04/89 at: 1545

Type of Bioassay : STATIC  
 (Daphnia magna Acute Lethality Toxicity  
 Test Protocol, OME, 1988)

Test Animal : D. magna  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal  
 95% fid. limits : 0.0 - 0.0 %

## TOXICITY TEST PARAMETERS

Sample Number: 05890031

TEST CONC. %  
 ELAPSED TIME  
 00:00 49:10

100	pH 7.3 7.6 O2 ppm 8.8 8.8 Cond. 1880 1910 Temp(C) 20.0 20.0
50	pH 7.6 7.8 O2 ppm 9.0 8.9 Cond. 1220 1260 Temp(C) 20.0 20.0
26	pH 7.8 7.9 O2 ppm 9.2 9.0 Cond. 900 920 Temp(C) 20.0 20.0
13	pH 7.9 7.9 O2 ppm 9.0 9.2 Cond. 720 780 Temp(C) 20.0 20.0
6	pH 7.9 7.9 O2 ppm 9.2 9.2 Cond. 620 680 Temp(C) 20.0 20.0
Control	pH 8.0 7.9 O2 ppm 9.2 9.2 Cond. 520 595 Temp(C) 20.0 20.0

## MISA-PETROLEUM-DAPHNIA

## TOXICITY TEST REPORT Sample: 05890036

TEST CONDITIONS

Company : Petrosar Limited  
 Region : South East  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (200)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : C. Ferguson  
 Date Collected : 05/01/89  
 Received : 05/01/89  
 Tested : 05/03/89 at: 1020

Type of Bioassay : STATIC  
 (Daphnia magna Acute Lethality Toxicity  
 Test Protocol. OME, 1988)

Test Animal : D. magna  
 Weight(gm) :  
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E	TOTAL MORTALITY
%	00:00 48:05	%
100	0	8
50	0	0
20	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve : none  
 LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 05890036

TEST CONC. %  
 E L A P S E D T I M E  
 00:00 48:05

100	pH 7.3 O2 ppm 7.4 Cond. 9.6 Temp(C) 2080 2400 20.0 20.0
50	pH 7.8 O2 ppm 7.7 Cond. 9.6 Temp(C) 1220 1420 20.0 20.0
26	pH 7.9 O2 ppm 7.9 Cond. 9.6 Temp(C) 940 1010 20.0 20.0
13	pH 8.0 O2 ppm 8.0 Cond. 9.6 Temp(C) 700 790 20.0 20.0
6	pH 8.0 O2 ppm 8.0 Cond. 9.4 Temp(C) 540 620 20.0 20.0
Control	pH 8.1 O2 ppm 8.1 Cond. 9.8 Temp(C) 490 510 20.0 20.0

COMPANY: Shell Canada Products Limited, Sarnia  
(510107)  
(now with Sarnia Mfg.)  
SECTOR: Petroleum Refining  
REGION: Southwest

#### SUMMARY

The data for six trout bioassays, conducted on process effluent samples collected between December 1988 and May 1989, were provided by Shell Canada Products Limited. All six process effluent samples were determined to have been non-acutely lethal to test fish. Data for bioassays conducted on three intake water samples collected in December 1988, January and May 1989 indicate they were not acutely lethal. Data for bioassays conducted on cooling water samples collected in January and May 1989 indicate they were not acutely lethal.

---

#### intake water

05880007 sampled: 12/12/88 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:  
  
05890007 sampled: 01/16/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:  
  
05890037 sampled: 05/08/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

#### Process Effluent

05880006 sampled: 12/12/88 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:  
  
05890008 sampled: 01/16/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:  
  
05890012 sampled: 02/06/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:  
  
05890027 sampled: 03/28/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

Shell Canada Products Limited (continued)

05890032 sampled: 04/10/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

01890060 sampled: 04/26/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA audit sample.

05890040 sampled: 05/08/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

SW to Talford creek

CW to Talford Creek

05890004 sampled: 01/16/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890038 sampled: 05/08/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

CW from POW

05890005 sampled: 01/16/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890039 sampled: 05/08/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

EO from storm pond

SW to Baby creek

CW to POW

05890006 sampled: 01/16/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

SLOPE of Mortality Curve :  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05880007

TEST CONDITIONS

Company : Shell Canada Products Limited  
Sarnia, ONT  
(S10107)  
Region : Southeast  
Industry : Petroleum Refining  
Control point : Intake water, (100)  
Laboratory : Pellutech  
Sampling Method : Grab  
Sampled By : T. Moran  
Date Collected : 12/12/88  
Date Received : 12/12/88  
Tested : 12/13/88 at: 1130

Type of Bioassay

: STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish, OME, 1983).

Test Animal  
Weight(gm)  
Length(mm)

: Rainbow trout  
:  
:

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E								TOTAL MORTALITY	
%	00:00	02:10	03:10	05:00	22:10	46:25	70:10	95:10	%	
100	0	0	0	0	0	0	0	0	0	
75	0	0	0	0	0	0	0	0	0	
50	0	0	0	0	0	0	0	0	0	
25	0	0	0	0	0	0	0	0	0	
10	0	0	0	0	0	0	0	0	0	
1	0	0	0	0	0	0	0	0	0	
Control	7	0	0	0	0	0	0	0	0	
Control	0	0	0	0	0	0	0	0	0	

% RZR LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Confidence :

TOXICITY TEST PARAMETERS

Sample Number: 05880007

TEST CONC.	E L A P S E D T I M E									
%	00:00	02:10	03:10	05:00	22:10	46:25	70:10	95:10		
100	pH	7.6	7.6	7.8	7.8	7.8	7.8	7.8		
	O2 ppm	10.2	10.2	10.0	10.0	10.0	10.0	10.0		
	Cond.	208	208	212	212	212	212	212		
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0		
75	pH	7.5	7.5	7.8	7.8	7.8	7.8	7.8		
	O2 ppm	10.1	10.1	10.0	10.0	10.0	10.0	10.0		
	Cond.	195	195	202	202	202	202	202		
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0		
56	pH	7.4	7.4	7.7	7.7	7.7	7.7	7.7		
	O2 ppm	10.0	10.0	10.0	10.0	10.0	10.0	10.0		
	Cond.	188	188	188	188	188	188	188		
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0		
25	pH	7.2	7.2	7.7	7.7	7.7	7.7	7.7		
	O2 ppm	10.1	10.1	10.1	10.1	10.1	10.1	10.1		
	Cond.	172	172	182	182	182	182	182		
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0		
10	pH	7.3	7.3	7.7	7.7	7.7	7.7	7.7		
	O2 ppm	9.9	9.9	10.0	10.0	10.0	10.0	10.0		
	Cond.	165	165	170	170	170	170	170		
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0		
1	pH	7.2	7.2	7.7	7.7	7.7	7.7	7.7		
	O2 ppm	9.8	9.8	9.7	9.7	9.7	9.7	9.7		
	Cond.	160	160	160	160	160	160	160		
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0		
Control	pH	7.0	7.0	7.6	7.6	7.6	7.6	7.6		
	O2 ppm	10.2	10.2	10.1	10.1	10.1	10.1	10.1		
	Cond.	162	162	168	168	168	168	168		
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0		
Control	pH	7.1	7.1	7.6	7.6	7.6	7.6	7.6		
	O2 ppm	10.3	10.3	10.1	10.1	10.1	10.1	10.1		
	Cond.	162	162	162	162	162	162	162		
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0	15.0		

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none  
LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 05890007

## TEST CONDITIONS

Company : Shell Canada Products Limited  
Sarnia, ONT (510107)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : intake water, (100)  
Laboratory : Pollutech  
Sampling Method : grab  
Sampled By : T. Moran  
Date Collected : 01/16/89  
Received : 01/16/89  
Tested : 01/17/89 at: 1230

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	22:10	46:00	70:00	95:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890007

TEST CONC. %	E L A P S E D T I M E				
	00:00	22:10	46:00	70:00	95:10
100	pH 7.8 O2 ppm 10.8 Cond. 212 Temp(C) 15.0	7.7 7.7 10.0 9.9 15.0 15.0	7.7 7.7 10.2 10.2 15.0 15.0	7.8 7.8 10.2 10.2 15.0 15.0	7.8 7.8 10.1 10.1 15.0 15.0
75	pH 7.8 O2 ppm 10.8 Cond. 202 Temp(C) 15.0	7.7 7.7 10.8 9.8 15.0 15.0	7.7 7.7 9.8 10.2 15.0 15.0	7.8 7.8 10.2 10.2 15.0 15.0	7.8 7.8 10.2 10.2 15.0 15.0
56	pH 7.7 O2 ppm 10.6 Cond. 194 Temp(C) 15.0	7.6 7.7 10.1 10.1 15.0 15.0	7.7 7.8 10.2 10.2 15.0 15.0	7.8 7.8 10.2 10.2 15.0 15.0	7.8 7.8 10.2 10.2 15.0 15.0
25	pH 7.7 O2 ppm 10.4 Cond. 182 Temp(C) 15.0	7.7 7.7 10.4 10.2 15.0 15.0	7.6 7.6 9.8 10.0 15.0 15.0	7.8 7.8 10.0 10.0 15.0 15.0	7.7 7.7 10.2 10.0 15.0 15.0
10	pH 7.7 O2 ppm 10.4 Cond. 180 Temp(C) 15.0	7.7 7.7 10.4 9.9 15.0 15.0	7.6 7.7 10.0 10.0 15.0 15.0	7.7 7.7 10.0 10.0 15.0 15.0	7.7 7.7 10.0 10.0 15.0 15.0
1	pH 7.7 O2 ppm 10.2 Cond. 178 Temp(C) 15.0	7.8 7.8 9.9 10.0 15.0 15.0	7.7 7.7 10.0 10.2 15.0 15.0	7.9 7.9 10.2 10.2 15.0 15.0	7.8 7.8 10.2 10.2 15.0 15.0
Control	pH 7.6 O2 ppm 10.4 Cond. 170 Temp(C) 15.0	7.7 7.7 9.9 9.9 15.0 15.0	7.7 7.7 10.0 10.0 15.0 15.0	7.8 7.8 10.0 10.0 15.0 15.0	7.7 7.7 10.2 10.2 15.0 15.0
Control	pH 7.6 O2 ppm 10.2 Cond. 170 Temp(C) 15.0	7.7 7.7 10.0 10.0 15.0 15.0	7.7 7.7 10.0 10.0 15.0 15.0	7.8 7.8 10.2 10.2 15.0 15.0	7.7 7.7 10.2 10.2 15.0 15.0

## TOXICITY TEST REPORT      Sample: 05890037

## TEST CONDITIONS

Company : Shell Canada Products Limited  
Sarnia, ONT  
(513167)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Intake water, (100)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : T. Moran  
Date Collected : 05/08/89  
Date Received : 05/08/89  
Date Tested : 05/09/89 at: 1430

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	%	00:00	19:00	44:10	69:15	97:10	TOTAL MORTALITY %
100	100	0	0	0	0	0	0
75	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890037

TEST CONC. %	ELAPSED TIME	00:00	19:00	44:10	69:15	97:10
100	pH	7.7	7.5	7.5	7.5	7.6
	O2 ppm	10.8	9.4	9.2	9.4	9.3
	Cond.	214				214
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.4	7.4	7.4	7.4	7.6
	O2 ppm	10.4	9.5	9.6	9.2	9.2
	Cond.	202				201
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.4	7.4	7.5	7.4	7.5
	O2 ppm	10.3	9.5	9.6	9.3	9.0
	Cond.	198				199
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.5	7.5	7.5	7.4	7.5
	O2 ppm	10.0	9.5	9.6	9.2	9.5
	Cond.	182				181
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.5	7.5	7.5	7.5	7.5
	O2 ppm	10.0	9.8	9.4	9.4	9.3
	Cond.	176				175
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.4	7.4	7.6	7.5	7.6
	O2 ppm	10.1	10.0	9.4	9.4	9.4
	Cond.	170				169
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.2	7.4	7.4
	O2 ppm	10.2	9.8	9.4	9.3	9.4
	Cond.	168				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.3	7.5	7.4
	O2 ppm	10.2	9.7	9.2	9.4	9.4
	Cond.	168				169
	Temp(C)	15.0	15.0	15.0	15.0	15.0

## HTSA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05880006

## TEST CONDITIONS

Company : Shell Canada Products Limited  
Sarnia  
ONT  
(510107)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : T. Moran  
Date Collected : 12/12/88  
Received : 12/12/88  
Tested : 12/13/88 at: 1130

## Type of Bioassay

: STATIC  
(protocol to determine the acute lethality  
of liquid effluents to fish. OME, 1983).

Test Animal  
Weight(gm)  
Length(mm)

: Rainbow trout

:

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E										TOTAL MORTALITY	
	%	00:00	02:10	03:10	05:00	22:25	46:10	70:00	95:10	%		
100	0	0	0	0	0	0	0	0	0	0		
75	0	0	0	0	0	0	0	0	0	0		
56	0	0	0	0	0	0	0	0	0	0		
25	0	0	0	0	0	0	0	0	0	0		
10	0	0	0	0	0	0	0	0	0	0		
1	0	0	0	0	0	0	0	0	0	0		
Control	0	0	0	0	0	0	0	0	0	0		
Control	0	0	0	0	0	0	0	0	0	0		

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :  
LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 05880006

TEST CONC. %	E L A P S E D T I M E									
	00:00	02:10	03:10	05:00	22:25	46:10	70:00	95:10		
100	pH	7.3				7.6	7.6	7.7		
	02 ppm	7.6				8.9	9.2	7.8		
	Cond.	650				15.0	15.0	15.0		
75	Temp(C)	15.0				15.0	15.0	15.0		
	pH	7.2				7.6	7.6	7.6		
	02 ppm	7.4				8.8	9.1	9.8		
56	Cond.	525				15.0	15.0	15.0		
	Temp(C)	15.0				15.0	15.0	15.0		
25	pH	7.1				7.5	7.5	7.7		
	02 ppm	7.8				8.9	9.0	9.8		
	Cond.	430				15.0	15.0	15.0		
10	Temp(C)	15.0				15.0	15.0	15.0		
	pH	7.0				7.5	7.5	7.7		
	02 ppm	9.1				9.0	9.1	10.0		
1	Cond.	282				15.0	15.0	15.0		
	Temp(C)	15.0				15.0	15.0	15.0		
Control	pH	7.1				7.6	7.7	7.7		
	02 ppm	9.2				9.5	9.2	10.1		
	Cond.	210				15.0	15.0	15.0		
Control	Temp(C)	15.0				15.0	15.0	15.0		
	pH	7.0				7.5	7.6	7.6		
	02 ppm	9.9				9.9	9.9	10.0		
Control	Cond.	170				15.0	15.0	15.0		
	Temp(C)	15.0				15.0	15.0	15.0		
Control	pH	7.0				7.6	7.7	7.6		
	02 ppm	10.2				10.0	10.0	10.1		
	Cond.	162				15.0	15.0	15.0		
Control	Temp(C)	15.0				15.0	15.0	15.0		
	pH	7.1				7.6	7.6	7.6		
	02 ppm	10.3				9.9	10.1	10.1		
Control	Cond.	162				15.0	15.0	15.0		
	Temp(C)	15.0				15.0	15.0	15.0		

## TOXICITY TEST REPORT Sample: 05890008

## TEST CONDITIONS

Company : Shell Canada Products Limited  
Sarnia, ONT  
(510107)Region : Southwest  
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech

Sampling Method : Grab

Sampled By : Y. Kuran

Date Collected : 01/16/89

Received : 01/16/89

Tested : 01/17/89 at: 1230

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish, OME, 1983).

Test Animal : Rainbow trout

Weight(gm) :

Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	22:10	47:10	70:00	95:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890008

TEST CONC. %	E L A P S E D T I M E				
	00:00	22:10	47:10	70:00	95:10
100	pH 7.4	7.6	7.5	7.8	7.8
	O2 ppm 8.8	10.0	9.9	10.4	10.2
	Cond. 540	540	540	550	550
	Temp(C) 15.0	15.0	15.0	15.0	15.0
75	pH 7.5	7.6	7.7	7.8	7.8
	O2 ppm 9.4	10.0	9.9	10.0	10.0
	Cond. 464	464	464	460	460
	Temp(C) 15.0	15.0	15.0	15.0	15.0
56	pH 7.5	7.5	7.6	7.9	7.8
	O2 ppm 9.6	9.6	9.8	10.6	9.2
	Cond. 388	388	388	388	388
	Temp(C) 15.0	15.0	15.0	15.0	15.0
25	pH 7.6	7.6	7.6	7.8	7.8
	O2 ppm 10.2	10.0	9.4	10.2	9.0
	Cond. 268	268	268	270	270
	Temp(C) 15.0	15.0	15.0	15.0	15.0
10	pH 7.7	7.4	7.5	7.7	7.8
	O2 ppm 10.4	9.0	9.7	9.6	9.3
	Cond. 206	206	206	210	210
	Temp(C) 15.0	15.0	15.0	15.0	15.0
1	pH 7.7	7.6	7.6	7.7	7.7
	O2 ppm 10.4	9.6	9.9	9.8	9.6
	Cond. 178	178	178	182	182
	Temp(C) 15.0	15.0	15.0	15.0	15.0
Control	pH 7.6	7.7	7.7	7.8	7.7
	O2 ppm 10.4	9.9	9.9	10.0	10.2
	Cond. 170	170	170	182	182
	Temp(C) 15.0	15.0	15.0	15.0	15.0
Control	pH 7.6	7.6	7.7	7.8	7.7
	O2 ppm 10.2	10.0	10.0	10.2	10.2
	Cond. 170	170	170	182	182
	Temp(C) 15.0	15.0	15.0	15.0	15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none  
LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 05890012

## TEST CONDITIONS

Company : Shell Canada Products Limited  
Sarnia, ONT  
(S10107)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : C. Ferguson  
Date Collected : 02/06/89  
Received : 02/06/89  
Tested : 02/07/89 at: 1625

## Type of Bioassay

: STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish, DNE, 1983).

Test Animal  
Weight(gm)  
Length(mm)

: Rainbow trout  
:  
:

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY
%	00:00	21:15	45:05	70:15	95:05		%
100	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890012

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 21:15 45:05 70:15 95:05

100	pH	7.1	7.8	7.7	7.7	7.7
	O <sub>2</sub> ppm	7.2	9.5	8.6	8.8	9.7
	Cond.	500				890
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.1	7.6	7.5	7.7	7.7
	O <sub>2</sub> ppm	8.4	9.0	8.6	8.8	9.5
	Cond.	700				710
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.2	7.7	7.6	7.8	7.7
	O <sub>2</sub> ppm	9.0	9.4	8.6	9.2	9.7
	Cond.	600				590
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.3	7.7	7.5	7.7	7.6
	O <sub>2</sub> ppm	10.2	9.3	9.2	9.4	9.6
	Cond.	340				349
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.4	7.9	7.6	7.7	7.7
	O <sub>2</sub> ppm	10.6	9.8	9.6	9.4	10.0
	Cond.	230				242
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.3	7.8	7.5	7.6	7.7
	O <sub>2</sub> ppm	10.6	9.8	9.4	9.5	10.1
	Cond.	170				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.7	7.5	7.6	7.6
	O <sub>2</sub> ppm	10.8	9.8	9.9	10.0	9.7
	Cond.	162				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.6	7.4	7.5	7.6
	O <sub>2</sub> ppm	11.0	9.8	9.8	9.9	9.7
	Cond.	162				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0

## TOXICITY TEST REPORT      Sample: 05890027

TEST CONDITIONS

Company : Shell Canada Products Limited  
(510107)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : T. Moran  
Date Collected : 03/28/89  
Received : 03/28/89  
Tested : 03/29/89 at: 930

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	25:10	50:20	82:10	10:00	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890027

TEST CONC. %      ELAPSED TIME  
00:00 25:10 50:20 82:10 10:00

100	pH 7.1	7.7	7.6	7.6	7.6
	O2 ppm 7.7	9.8	9.8	9.8	9.8
	Cond. 680				610
	Temp(C) 15.0	15.0	15.0	15.0	15.0
100	pH 7.1	7.6	7.7	7.6	7.6
	O2 ppm 7.9	9.8	9.7	9.9	9.9
	Cond. 655				620
	Temp(C) 15.0	15.0	15.0	15.0	15.0
Control	pH 7.4	7.5	7.5	7.5	7.5
	O2 ppm 10.6	10.1	10.2	10.1	10.1
	Cond. 155				168
	Temp(C) 15.0	15.0	15.0	15.0	15.0
Control	pH 7.4	7.6	7.6	7.5	7.5
	O2 ppm 10.6	10.3	10.1	10.1	10.1
	Cond. 155				168
	Temp(C) 15.0	15.0	15.0	15.0	15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none  
 LC50 Calculated By : none

## TOXICITY TEST REPORT Sample: 05890032

## TEST CONDITIONS

Company : Shell Canada Products Limited  
 : Sarnia, ONT  
 : (510107)  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (200)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : C. Ferguson  
 Date Collected : 04/10/89  
 Received : 04/10/89  
 Tested : 04/11/89 at: 1420

## Type of Bioassay

: STATIC  
 (Protocol to determine the acute lethality  
 of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY
%	00:00	19:10	43:20	68:20	96:10	%	
100	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal  
 95% fid. limits : 0.0 - 0.0 %  
 Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890032

TEST CONC.	E L A P S E D T I M E					
%	00:00	19:10	43:20	68:20	96:10	
100	pH	7.2	7.3	7.6	7.7	7.7
	O2 ppm	8.2	8.9	9.8	9.6	9.6
	Cond.	488				479
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.2	7.3	7.6	7.7	7.7
	O2 ppm	8.2	8.8	9.6	9.4	9.4
	Cond.	492				482
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.4	7.4	7.5	7.5	7.4
	O2 ppm	10.2	10.2	10.0	9.8	10.0
	Cond.	164				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.4	7.4	7.5	7.5	7.4
	O2 ppm	10.3	10.1	9.9	9.8	10.1
	Cond.	164				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0

TOXICITY TEST REPORT Sample: 01890060

TEST CONDITIONS

Company : Shell Canada Products Limited  
Sarnia, ONT  
(510107)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : MOE  
Sampling Method : Grab  
Sampled By : D. Hamilton  
Date Collected : 04/26/89  
Received : 04/27/89  
Tested : 04/27/89 at: 1500

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish.. ONE, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E							TOTAL MORTALITY
%	00:00	00:30	24:00	48:00	72:00	96:00	%	%
100	0	0	0	0	0	1	10	10
65	0	0	0	0	0	1	10	10
40	0	0	0	0	0	0	0	0
30	0	0	0	0	0	1	10	10
20	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : MISA audit sample.

## TOXICITY TEST PARAMETERS

Sample Number: 01890060

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 00:30 24:00 48:00 72:00 96:00

100	pH	7.5	7.5	8.4	8.1	7.9	8.3
	O2 ppm	8.5	8.5	9.8	9.7	9.8	9.6
	Cond.	665	665	630	650	650	650
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
65	pH	7.8	8.2	8.0	7.9	8.3	
	O2 ppm	9.1	9.7	9.8	9.8	9.5	
	Cond.	515	500	490	495	500	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	
40	pH	7.8	8.0	8.0	8.1	8.0	
	O2 ppm	9.3	9.6	9.5	9.7	9.4	
	Cond.	420	410	415	410	415	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	
30	pH	7.7	8.0	8.0	8.0	8.1	
	O2 ppm	9.4	9.7	9.8	9.7	9.5	
	Cond.	385	375	380	370	380	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	
20	pH	7.7	8.0	7.9	7.8	8.1	
	O2 ppm	9.3	9.7	9.8	9.7	9.5	
	Cond.	345	340	340	335	335	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	
10	pH	7.6	7.9	7.9	7.7	7.7	8.0
	O2 ppm	9.6	9.7	9.7	9.8	9.6	
	Cond.	305	295	300	295	300	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	
Control	pH	7.7	7.6	7.6	7.6	7.6	7.4
	O2 ppm	9.5	9.8	9.7	9.7	9.6	
	Cond.	270	260	260	260	260	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	

## HISA-PETROLEUM-FISH

SLOPE of Mortality Curve :  
LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 05890040

## TEST CONDITIONS

Company : Shell Canada Products Limited  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : T. Moran  
Date Collected : 05/08/89  
Received : 05/08/89  
Tested : 05/09/89 at: 1430

## Type of Bioassay

: Static  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME					TOTAL MORTALITY
%	00:00	19:00	44:10	69:15	97:10	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890040

TEST CONC. %  
ELAPSED TIME  
00:00 19:00 44:10 69:15 97:10

100	pH	7.2	7.8	7.7	7.8	7.8
	O2 ppm	8.0	9.0	9.6	9.4	9.5
	Cond.	580				550
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.3	7.7	7.6	7.7	7.7
	O2 ppm	8.0	9.1	9.6	9.2	9.3
	Cond.	580				560
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.2	7.4	7.4
	O2 ppm	10.2	9.8	9.4	9.3	9.4
	Cond.	168				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.3	7.5	7.5
	O2 ppm	10.2	9.7	9.2	9.4	9.6
	Cond.	168				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0

SLOPE of Mortality Curve : none  
 LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890004

## TEST CONDITIONS

Company : Shell Canada Products Limited  
 Sarnia, ONT  
 (S10107)

Region : Southwest  
 Industry : Petroleum Refining

Control point : CW to Talford Creek, (400)

Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : J. Moran  
 Date Collected : 01/16/89  
 Received : 01/15/89  
 Tested : 01/17/89 at: 1230

Type of Bioassay : STATIC  
 (Protocol to determine the acute lethality  
 of liquid effluents to fish, ONE, 1983).

Test Animal : Rainbow trout  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME							TOTAL MORTALITY %
%	00:00	22:10	47:10	70:00	95:10			
100	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890004

TEST CONC. %  
 ELAPSED TIME  
 00:00 22:10 47:10 70:00 95:10

100	pH 9.4 Cond. Temp(C)	7.8 9.4 224 15.0	7.7 9.8 224 15.0	7.7 9.8 224 15.0	7.8 10.2 224 15.0
75	pH 9.6 Cond. Temp(C)	7.7 9.6 210 15.0	7.7 10.0 210 15.0	7.8 9.8 210 15.0	7.8 10.2 210 15.0
56	pH 9.8 Cond. Temp(C)	7.7 9.8 202 15.0	7.6 10.0 202 15.0	7.6 9.9 205 15.0	7.7 10.1 205 15.0
25	pH 10.2 Cond. Temp(C)	7.6 10.2 186 15.0	7.7 10.0 186 15.0	7.6 10.0 192 15.0	7.8 10.2 192 15.0
10	pH 10.4 Cond. Temp(C)	7.6 10.4 180 15.0	7.6 10.0 180 15.0	7.6 10.0 189 15.0	7.8 10.2 189 15.0
1	pH 10.4 Cond. Temp(C)	7.6 10.4 174 15.0	7.6 10.2 174 15.0	7.8 10.1 182 15.0	7.7 10.4 182 15.0
Control	pH 10.4 Cond. Temp(C)	7.6 10.4 170 15.0	7.7 9.9 170 15.0	7.7 10.0 182 15.0	7.7 10.2 182 15.0
Control	pH 10.2 Cond. Temp(C)	7.6 10.2 170 15.0	7.7 10.0 170 15.0	7.8 10.0 182 15.0	7.7 10.2 182 15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :  
LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 05890038

## TEST CONDITIONS

Company : Shell Canada Products Limited  
Sarnia, ONT  
(510107)

Region : Southwest  
Industry : Petroleum Refining

Control point : CW to Talford Creek, (400)

Laboratory : Pollutech

Sampling Method : grab

Sampled By : J. Moran

Date Collected : 05/08/89

Received : 05/08/89

Tested : 05/09/89 at: 1430

## Type of Bioassay

: STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. ONE, 1983).

: Rainbow trout

: :

Test Animal

Weight(gm)

Length(mm)

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E				TOTAL MORTALITY	
%	00:00	19:00	44:10	69:15	97:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

TEST CONC.	E L A P S E D T I M E				TOTAL MORTALITY	
%	00:00	19:00	44:10	69:15	97:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890038

TEST CONC. %	E L A P S E D T I M E					
	00:00	19:00	44:10	69:15	97:10	
100	pH	7.8	7.6	7.6	7.6	7.5
	O2 ppm	9.1	9.6	9.4	9.2	9.0
	Cond.	216				214
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.7	7.6	7.6	7.6	7.6
	O2 ppm	9.3	9.5	9.5	9.1	9.2
	Cond.	204				203
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.6	7.5	7.5	7.6	7.6
	O2 ppm	9.6	9.6	9.2	9.3	9.4
	Cond.	198				199
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.5	7.5	7.5	7.6	7.6
	O2 ppm	9.8	9.2	9.3	9.2	9.1
	Cond.	182				181
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.5	7.5	7.5	7.5	7.5
	O2 ppm	10.0	9.4	9.4	9.2	9.0
	Cond.	174				175
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.5	7.5	7.5	7.6	7.6
	O2 ppm	10.1	9.6	9.2	9.2	9.4
	Cond.	170				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.2	7.4	7.4
	O2 ppm	10.2	9.8	9.4	9.3	9.4
	Cond.	168				168
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.3	7.4	7.4
	O2 ppm	10.2	9.7	9.2	9.6	9.6
	Cond.	168				169
	Temp(C)	15.0	15.0	15.0	15.0	15.0

SLOPE of Mortality Curve : none  
 LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890005

## TEST CONDITIONS

Company : Shell Canada Products Limited  
 : Sarnia, ONT  
 : (510107)  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : CW from POW, (500)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : T. Moran  
 Date Collected : 01/16/89  
 Received : 01/16/89  
 Tested : 01/17/89 at: 1230

Type of Bioassay : STATIC  
 (Protocol to determine the acute lethality  
 of liquid effluents to fish, DME, 1983).

Test Animal : Rainbow trout  
 Weight(gm) :  
 Length(cm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY
%	00:00	22:10	47:10	70:00	95:10		%
100	0	1	1	1	1	1	10
75	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890005

TEST CONC. %  
 E L A P S E D T I M E  
 00:00 22:10 47:10 70:00 95:10

100	pH	7.7	7.6	7.6	7.8	7.7
	O2 ppm	9.6	9.8	9.9	9.6	10.2
	Cond.	262				262
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.7	7.6	7.6	7.8	7.7
	O2 ppm	9.8	10.1	9.8	9.6	9.9
	Cond.	234				245
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.7	7.6	7.6	7.7	7.6
	O2 ppm	9.8	10.2	9.8	9.6	9.9
	Cond.	224				229
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.6	7.6	7.6	7.7	7.7
	O2 ppm	10.2	10.4	9.9	9.6	10.2
	Cond.	200				205
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.6	7.7	7.6	7.8	7.7
	O2 ppm	10.4	10.1	9.9	9.8	10.3
	Cond.	192				199
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.6	7.7	7.6	7.9	7.7
	O2 ppm	10.4	10.4	9.9	10.0	10.2
	Cond.	178				189
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.7	7.7	7.8	7.7
	O2 ppm	10.4	9.9	9.9	10.0	10.2
	Cond.	170				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.6	7.7	7.7	7.8	7.7
	O2 ppm	10.2	10.0	10.0	10.2	10.2
	Cond.	170				182
	Temp(C)	15.0	15.0	15.0	15.0	15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :  
LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 05890039

## TEST CONDITIONS

Company : Shell Canada Products Limited  
Sarnia, ONT  
(S10107)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : CW from PGM, (500)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : T. Moran  
Date Collected : 05/08/89  
Received : 05/08/89  
Tested : 05/09/89 at: 1430

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish, OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	%	00:00	19:00	44:10	69:15	97:10	%
100	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890039

TEST CONC. %  
E L A P S E D T I M E  
00:00 19:00 44:10 69:15 97:10

100	pH	7.8	7.7	7.5	7.6	7.5
	02 ppm	9.5	9.5	9.6	9.2	9.2
	Cond.	218			218	
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.7	7.7	7.6	7.6	7.6
	02 ppm	9.6	9.5	9.4	9.6	9.7
	Cond.	208			208	
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.6	7.6	7.6	7.6	7.6
	02 ppm	9.6	9.6	9.2	9.6	9.5
	Cond.	198			198	
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.5	7.6	7.6	7.6	7.6
	02 ppm	9.7	9.4	9.6	9.4	9.6
	Cond.	182			181	
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.5	7.6	7.6	7.6	7.5
	02 ppm	9.8	9.3	9.4	9.5	9.1
	Cond.	178			178	
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.5	7.5	7.6	7.6	7.5
	02 ppm	10.0	9.6	9.6	9.6	9.4
	Cond.	172			172	
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.2	7.4	7.4
	02 ppm	10.2	9.8	9.4	9.3	9.4
	Cond.	168			168	
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.3	7.5	7.4
	02 ppm	10.2	9.7	9.2	9.4	9.6
	Cond.	168			169	
	Temp(C)	15.0	15.0	15.0	15.0	15.0

## TOXICITY TEST REPORT

Sample: 05890006

TEST CONDITIONS

Company : Shell Canada Products Limited  
 : Sarnia, ONT  
 : (510107)  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : CW to POW, (800)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : T. Moran  
 Date Collected : 01/16/89  
 Received : 01/16/89  
 Tested : 01/17/89 at: 1230

Type of Bioassay : STATIC  
 (Protocol to determine the acute lethality  
 of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout  
 Weight(gm) :  
 Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY %
		00:00 22:10 47:10 71:10 93:00	
75	0	0 0 0 0 0	0
56	0	0 0 0 0 0	0
25	0	0 0 0 0 0	0
10	0	0 0 0 0 0	0
1	0	0 0 0 0 0	0
Control	0	0 0 0 0 0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve : none  
 LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 05890006

TEST CONC.	%	ELAPSED TIME
		00:00 22:10 47:10 71:10 93:00
100		pH 7.8 7.8 7.6 7.8 7.7 O2 ppm 9.6 9.6 9.8 10.0 10.0 Cond. 238 Temp(C) 15.0 15.0 15.0 15.0 15.0
75		pH 7.8 7.7 7.6 7.8 7.6 O2 ppm 9.8 10.0 9.8 10.0 10.1 Cond. 212 Temp(C) 15.0 15.0 15.0 15.0 15.0
56		pH 7.7 7.7 7.6 7.8 7.6 O2 ppm 10.0 9.0 9.9 10.0 10.0 Cond. 206 Temp(C) 15.0 15.0 15.0 15.0 15.0
25		pH 7.7 7.7 7.6 7.8 7.6 O2 ppm 10.4 10.2 9.7 10.0 10.0 Cond. 190 Temp(C) 15.0 15.0 15.0 15.0 15.0
10		pH 7.6 7.6 7.5 7.7 7.6 O2 ppm 10.4 9.7 9.8 9.9 9.9 Cond. 182 Temp(C) 15.0 15.0 15.0 15.0 15.0
1		pH 7.6 7.7 7.6 7.8 7.6 O2 ppm 10.2 10.1 9.9 9.8 10.2 Cond. 176 Temp(C) 15.0 15.0 15.0 15.0 15.0
Control		pH 7.6 7.7 7.7 7.8 7.7 O2 ppm 10.4 9.9 9.9 10.0 10.2 Cond. 170 Temp(C) 15.0 15.0 15.0 15.0 15.0
Control		pH 7.6 7.7 7.7 7.8 7.7 O2 ppm 10.2 10.0 10.0 10.2 10.2 Cond. 170 Temp(C) 15.0 15.0 15.0 15.0 15.0



COMPANY: Shell Canada Products Limited, Sarnia  
(510107)  
(now with Sarnia Mfg.)  
SECTOR: Petroleum Refining  
REGION: Southwest

#### SUMMARY

Results from 14 *Daphnia magna* acute lethality toxicity tests on samples collected between December 1988 and May 1989 were submitted by Shell Canada Products Limited in Sarnia. Five of the six samples of Process Effluent were not acutely lethal to *Daphnia*. The sample collected and tested in December was only mildly toxic with a 48 h LC50 > 100% effluent.

Toxicity test results submitted for three samples of Intake Water, two samples from CW. to Telford Creek, two samples of CW. from POW and one sample of CW. to Pow were all not acutely lethal to *Daphnia magna*.

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#### intake water

05880007 sampled: 12/12/88 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890007 sampled: 01/16/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890037 sampled: 05/08/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

#### Process Effluent

05880006 sampled: 12/12/88 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: Number of Floating *Daphnia* Observed

05890008 sampled: 01/16/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890012 sampled: 02/06/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890027 sampled: 03/28/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

Shell Canada Products Limited (continued)

05890032 sampled: 04/10/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

02890060 sampled: 04/26/89 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA Audit

05890040 sampled: 05/08/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

SW to Talford creek

CW to Talford Creek

05890004 sampled: 01/16/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890038 sampled: 05/08/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

CW from POW

05890005 sampled: 01/16/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890039 sampled: 05/08/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

EO from storm pond

SW to Baby creek

CW to POW

05890006 sampled: 01/16/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

SLOPE of Mortality Curve :  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05880007

TEST CONDITIONS

Company : Shell Canada Products Limited

Region : Sarnia, ONT

Industry : Southwest

Control point : intake water, (100)

Laboratory : Pollutech

Sampling Method : grab

Sampled By : J. Moran

Date Collected : 12/12/88

Date Received : 12/12/88

Tested : 12/14/88 at: 1200

Type of Bioassay

: STATIC (Daphnia magna Acute Lethality Toxicity Test Protocol, OME, 1988)

Test Animal

Weight(gm)

Length(mm)

: D. magna

:

:

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	00:00	47:00	%	TOTAL MORTALITY
100	0	1	0	0	0	0
50	0	0	0	0	0	0
26	0	0	0	0	0	0
13	0	0	0	0	0	0
6	0	0	0	0	0	0
Control	0	0	0	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05880007

TEST CONC. %  
ELAPSED TIME  
00:00 47:00

100	pH 02 ppm Cond. Temp(C)	7.8 9.4 200 20.0	7.8 9.4 250 20.0
50	pH 02 ppm Cond. Temp(C)	8.1 9.4 400 20.0	8.1 9.4 390 20.0
26	pH 02 ppm Cond. Temp(C)	8.1 9.4 500 20.0	8.1 9.4 500 20.0
13	pH 02 ppm Cond. Temp(C)	8.1 9.2 510 20.0	8.1 9.2 510 20.0
6	pH 02 ppm Cond. Temp(C)	8.1 9.2 560 20.0	8.1 9.2 560 20.0
Control	pH 02 ppm Cond. Temp(C)	8.1 9.4 560 20.0	8.1 9.4 570 20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890007

TOXICITY TEST PARAMETERS

TEST CONDITIONS

Company : Shell Canada Products Limited

Region : Sarnia, ONT

Industry : Southwest

Control point : Intake water, (100)

Laboratory : Pollutech

Sampling Method : Grab

Sampled By : T.Moran

Collected Date : 01/16/89

Received Date : 01/16/89

Tested : 01/17/89 at: 1330

Type of Bioassay

: STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, OHE, 1988)

Test Animal

Weight(gm)

Length(mm)

: D. magna

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 47:10	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50

: Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

Sample Number: 05890007

TEST CONC.  
%  
ELAPSED TIME  
00:00 47:10

100	pH 02 ppm Cond. Temp(C)	7.7 10.0 172 20.0	7.8 9.6 262 20.0
50	pH 02 ppm Cond. Temp(C)	7.9 9.2 424 20.0	7.9 9.6 422 20.0
26	pH 02 ppm Cond. Temp(C)	8.0 9.0 480 20.0	8.0 9.5 492 20.0
13	pH 02 ppm Cond. Temp(C)	8.0 8.8 504 20.0	8.0 9.6 500 20.0
6	pH 02 ppm Cond. Temp(C)	8.0 8.8 560 20.0	7.8 9.6 590 20.0
Control	pH 02 ppm Cond. Temp(C)	8.0 9.0 580 20.0	8.0 9.6 600 20.0

## TOXICITY TEST REPORT Sample: 05890037

## TEST CONDITIONS

Company : Shell Canada Products Limited  
(Sarnia, ONT)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : intake water, (100)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : T. Moran  
Date Collected : 05/08/89  
Received : 05/08/89  
Tested : 05/09/89 at: 1320

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, ONE, 1988)

Test Animal :  
Weight(gm) :  
Length(mm) :  
: D. magna

## MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 48:10	%
100	0	0
50	0	16
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890037

TEST CONC.  
% ELAPSED TIME  
00:00 48:10

100	pH 7.7 7.8 O2 ppm 10.2 8.8 Cond. 260 268 Temp(C) 20.0 20.0
50	pH 7.9 8.0 O2 ppm 9.4 8.8 Cond. 388 390 Temp(C) 20.0 20.0
26	pH 8.0 8.0 O2 ppm 9.0 8.6 Cond. 448 452 Temp(C) 20.0 20.0
13	pH 8.0 8.1 O2 ppm 9.0 8.8 Cond. 478 480 Temp(C) 20.0 20.0
6	pH 8.0 8.1 O2 ppm 9.0 8.8 Cond. 490 500 Temp(C) 20.0 20.0
Control	pH 8.0 8.1 O2 ppm 9.2 9.2 Cond. 500 500 Temp(C) 20.0 20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :  
LC50 Calculated By : >20% <=50% in 100% Conc.

## TOXICITY TEST REPORT Sample: 05880006

## TEST CONDITIONS

Company : Shell Canada Products Limited

Sarnia, ONI

(510107)

Region : Southwest

Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Polylutech

Sampling Method : Grab

Sample by : T. Moran

Date Collected : 12/12/88

Received : 12/12/88

Tested : 12/14/88 at: 1100

Type of Bioassay

: STATIC

: (Daphnia magna Acute Lethality Toxicity

Test Protocol, OME, 1988)

: D. magna

:

:

## MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 47:30	%
100	0	41
50	2	33
25	1	8
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : Number of Floating Daphnia Observed

## TOXICITY TEST PARAMETERS

Sample Number: 05880006

TEST CONC. %  
ELAPSED TIME  
00:00 47:30

100	pH 02 ppm Cond. Temp(C)	7.2 6.8 700 20.0	7.3 7.2 720 20.0
50	pH 02 ppm Cond. Temp(C)	7.6 8.6 720 20.0	7.9 8.6 620 20.0
26	pH 02 ppm Cond. Temp(C)	7.9 9.2 600 20.0	7.9 9.2 610 20.0
13	pH 02 ppm Cond. Temp(C)	8.1 9.5 580 20.0	8.0 9.3 605 20.0
6	pH 02 ppm Cond. Temp(C)	8.2 9.5 580 20.0	8.1 9.3 600 20.0
Control	pH 02 ppm Cond. Temp(C)	8.3 9.5 520 20.0	8.1 9.6 590 20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890008

## TEST CONDITIONS

Company : Shell Canada Products Limited  
(Sarnia, ONT (510107))  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : T. Moran  
Date Collected : 01/16/89  
Received : 01/16/89  
Tested : 01/17/89 at: 1415

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity Test Protocol, OME, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 47:25	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890008

TEST CONC. %  
ELAPSED TIME  
00:00 47:25

100	pH 02 ppm Cond. Temp(C)	7.3 8.0 9.6 600 20.0	7.6 9.6 600 20.0
50	pH 02 ppm Cond. Temp(C)	7.7 8.4 9.6 580 20.0	7.7 9.6 600 20.0
26	pH 02 ppm Cond. Temp(C)	7.9 8.6 9.5 580 20.0	7.9 9.6 595 20.0
13	pH 02 ppm Cond. Temp(C)	8.0 8.6 9.6 580 20.0	8.0 9.6 595 20.0
6	pH 02 ppm Cond. Temp(C)	8.0 8.6 9.6 600 20.0	8.0 9.6 600 20.0
Control	pH 02 ppm Cond. Temp(C)	8.0 9.0 9.6 580 80.0	7.9 9.6 605 20.0

HISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890012

TEST CONDITIONS

Company : Shell Canada Products Limited  
Sarnia, ONT  
(510107)

Region : Southwest  
Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : Ferguson  
Date Collected : 02/06/89  
Received : 02/06/89  
Tested : 02/07/89 at: 1615

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, ONE, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	01:25 46:25	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

TOXICITY TEST PARAMETERS

Sample Number: 05890012

TEST CONC. %  
ELAPSED TIME  
01:25 46:25

100	pH 7.2 O2 ppm 7.0 Cond. 980 Temp(C) 20.0	7.5 7.8 1100 20.0
50	pH 7.6 O2 ppm 8.4 Cond. 800 Temp(C) 20.0	7.8 8.2 820 20.0
26	pH 7.8 O2 ppm 8.6 Cond. 720 Temp(C) 20.0	7.9 9.0 750 20.0
13	pH 7.9 O2 ppm 9.0 Cond. 680 Temp(C) 20.0	8.0 9.3 700 20.0
6	pH 8.0 O2 ppm 9.2 Cond. 660 Temp(C) 20.0	8.0 9.4 660 20.0
Control	pH 8.0 O2 ppm 9.2 Cond. 620 Temp(C) 20.0	8.0 9.4 650 20.0

## TOXICITY TEST REPORT Sample: 05890027

## TEST CONDITIONS

Company : Shell Canada Products Limited  
Sarnia, ONT  
(510107)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : T. Moran  
Date Collected : 03/28/89  
Received : 03/28/89  
Tested : 03/28/89 at: 1400

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol. OME, 1988)

Test Animal :  
Weight(gm) :  
Length(mm) :  
: D. magna

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY %
100	0	00:00 48:00	0
50	0		0
26	0		0
13	0		0
6	0		0
Control	0		0

48 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890027

TEST CONC. %  
ELAPSED TIME  
00:00 48:00

100	pH 02 ppm Cond. Temp(C)	7.3 7.9 710 20.0	7.6 8.2 700 20.0
50	pH 02 ppm Cond. Temp(C)	7.6 8.3 610 20.0	7.8 8.3 610 20.0
26	pH 02 ppm Cond. Temp(C)	7.8 8.9 595 20.0	7.9 8.6 590 20.0
13	pH 02 ppm Cond. Temp(C)	7.9 9.2 580 20.0	8.0 8.7 570 20.0
6	pH 02 ppm Cond. Temp(C)	7.9 9.2 530 20.0	8.0 9.3 510 20.0
Control	pH 02 ppm Cond. Temp(C)	7.8 9.6 510 20.0	8.0 9.5 500 20.0

## MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890032

## TEST CONDITIONS

Company : Shell Canada Products Limited  
 Sarnia, ONT  
 (510107)  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (200)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : C. Ferguson  
 Date Collected : 04/10/89  
 Received : 04/10/89  
 Tested : 04/10/89 at: 1540

## Type of Bioassay

: STATIC  
 (Daphnia magna Acute Lethality Toxicity  
 Test Protocol, OME, 1988)

## Test Animal

Weight(gm)  
 Length(mm)  
 : D. magna  
 :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 48:05	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve : none  
 LC50 calculated by :

## TOXICITY TEST PARAMETERS

Sample Number: 05890032

TEST ELAPSED TIME  
 CONC. % 00:00 48:05

100	pH 7.4 O2 ppm 8.4 Cond. 500 Temp(C) 550 20.0	7.7 8.6 550 20.0
50	pH 7.9 O2 ppm 8.8 Cond. 495 Temp(C) 550 20.0	7.9 8.6 550 20.0
26	pH 8.0 O2 ppm 8.9 Cond. 490 Temp(C) 520 20.0	7.9 8.9 520 20.0
13	pH 8.1 O2 ppm 9.3 Cond. 500 Temp(C) 472 20.0	8.0 9.2 472 20.0
6	pH 8.1 O2 ppm 9.5 Cond. 505 Temp(C) 498 20.0	8.0 9.3 498 20.0
Control	pH 8.0 O2 ppm 9.4 Cond. 500 Temp(C) 505 20.0	8.0 9.4 505 20.0

TOXICITY TEST REPORT Sample: 02890060

TEST CONDITIONS

Company : Shell Canada Products Limited

Sarnia, ONT

(S10107)

Region : Southwest

Industry : Petroleum Refining

Control point : Process Effluent, (200)

Laboratory : MOE

Sampling Method : grab

Sampled By : Hamilton

Date Collected : 04/26/89

Received : 04/27/89

Tested : 04/27/89 at: 1430

Type of Bioassay

: STATIC

: (Daphnia magna Acute Lethality Toxicity

Test Protocol, OME, 1988)

: D. magna

: Test Animal

Weight(gm)

Length(mm)

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E			TOTAL MORTALITY
%	00:00 24:00 48:00			%
100	0	0	3	25
60	0	1	1	8
30	0	0	0	0
15	0	1	2	16
5	0	3	3	25
Control	0	0	0	0

48 Hour LC50 : &gt;100%

95% fid. limits : 0.0 - 0.0 %

Comments : MISA Audit

## TOXICITY TEST PARAMETERS

Sample Number: 02890060

TEST CONC. %	E L A P S E D T I M E
00:00	24:00 48:00

100	pH	7.6	8.1
	O2 ppm	9.0	7.9
	Cond.	811	751
	Temp(C)	20.0	20.0
60	pH	7.8	8.0
	O2 ppm	9.0	7.0
	Cond.	614	589
	Temp(C)	20.0	20.0
30	pH	7.9	8.1
	O2 ppm	9.0	7.0
	Cond.	472	459
	Temp(C)	20.0	20.0
15	pH	8.0	8.1
	O2 ppm	9.0	8.0
	Cond.	402	390
	Temp(C)	20.0	20.0
5	pH	8.1	8.1
	O2 ppm	8.9	8.1
	Cond.	357	350
	Temp(C)	20.0	20.0
Control	pH	8.1	8.0
	O2 ppm	9.1	8.2
	Cond.	332	330
	Temp(C)	20.0	20.0

## MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890040

## TEST CONDITIONS

Company : Shell Canada Products Limited  
 Sarnia, ONT  
 (510107)  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (200)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : T. Moran  
 Date Collected : 05/08/89  
 Received : 05/08/89  
 Tested : 05/11/89 at: 1400

Type of Bioassay : STATIC  
 Daphnia magna Acute Lethality Toxicity  
 Test Protocol: ONE, 1988)

Test Animal : D. magna  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 48:00	%
100	0 0	0
50	0 0	0
26	0 0	0
13	0 0	0
6	0 0	0
Control	0 0	0

48 Hour LC50 : Non-lethal  
 95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :  
 LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 05890040

TEST CONC.  
 % ELAPSED TIME  
 00:00 48:00

100	pH 7.4 7.6 O2 ppm 8.8 8.6 Cond. 580 650 Temp(C) 20.0 20.0
50	pH 7.7 7.8 O2 ppm 8.8 8.7 Cond. 540 590 Temp(C) 20.0 20.0
26	pH 7.9 7.9 O2 ppm 8.8 8.7 Cond. 520 550 Temp(C) 20.0 20.0
13	pH 7.9 7.9 O2 ppm 8.8 9.4 Cond. 500 510 Temp(C) 20.0 20.0
6	pH 8.0 7.9 O2 ppm 8.8 9.3 Cond. 500 510 Temp(C) 20.0 20.0
Control	pH 8.0 7.9 O2 ppm 8.8 9.2 Cond. 500 510 Temp(C) 20.0 20.0

SLOPE of Mortality Curve : none  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890004

## TOXICITY TEST PARAMETERS

## TEST CONDITIONS

Company : Shell Canada Products Limited

Region : Sarnia, ONT  
(S10107)

Industry : Southwest  
Petroleum Refining

Control point : CW to Telford Creek, (400)

Laboratory : Pollutech

Sampling Method : Grab

Sampled By : Y. Moran

Date Collected : 01/16/89

Received : 01/16/89

Tested : 01/16/89 at: 1645

Type of Bioassay

: STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, OME, 1988)

Test Animal : D. magna

Weight(gm) :

Length(mm) :

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY %
100	0	00:00 41:55	0
50	0		0
26	0		0
13	0		0
6	0		0
Control	0		0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

Sample Number: 05890004

TEST CONC. %  
ELAPSED TIME  
00:00 41:55

100	pH 8.0 8.1 02 ppm 9.2 8.8 Cond. 250 250 Temp(C) 20.0 20.0
50	pH 8.1 8.2 02 ppm 9.4 8.9 Cond. 400 390 Temp(C) 20.0 20.0
26	pH 8.1 8.2 02 ppm 9.4 8.9 Cond. 480 500 Temp(C) 20.0 20.0
13	pH 8.2 8.2 02 ppm 9.6 8.9 Cond. 520 520 Temp(C) 20.0 20.0
6	pH 8.2 8.2 02 ppm 10.0 9.0 Cond. 560 540 Temp(C) 20.0 20.0
Control	pH 8.1 8.2 02 ppm 9.8 9.1 Cond. 560 580 Temp(C) 20.0 20.0

## MISA-PETROLEUM-DAPHNIA

## TOXICITY TEST REPORT Sample: 05890038

TEST CONDITIONS

Company : Shell Canada Products Limited  
Sarnia, ONT  
(510107)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : CW to Talford Creek, (400)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : T.Moran  
Date Collected : 05/08/89  
Received : 05/08/89  
Tested : 05/09/89 at: 1300

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol. OAE, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 48:10	%
100	0	0
50	0	0
26	0	0
13	0	8
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :  
LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 05890038

TEST CONC. %  
ELAPSED TIME  
00:00 48:10

100	pH 7.8 O2 ppm 9.2 Cond. 252 Temp(C) 20.0	7.8 7.8 8.6 8.6 262 262 20.0 20.0
50	pH 7.9 O2 ppm 8.8 Cond. 382 Temp(C) 20.0	7.9 8.0 8.8 8.6 382 392 20.0 20.0
26	pH 8.0 O2 ppm 8.8 Cond. 440 Temp(C) 20.0	8.0 8.0 8.8 8.6 440 420 20.0 20.0
13	pH 8.0 O2 ppm 8.8 Cond. 472 Temp(C) 20.0	8.0 8.0 8.8 8.6 472 480 20.0 20.0
6	pH 8.0 O2 ppm 8.8 Cond. 486 Temp(C) 20.0	8.0 8.1 8.8 8.6 486 490 20.0 20.0

Control pH  
O2 ppm  
Cond.  
Temp(C)

SLOPE of Mortality Curve : none  
 LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890005

## TEST CONDITIONS

Company : Shell Canada Products Limited  
 Sarnia, ONT  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : CW from POW, (500)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : T. Moran  
 Date Collected : 01/16/89  
 Date Received : 01/16/89  
 Tested : 01/16/89 at: 1400

Type of Bioassay : STATIC (Daphnia magna Acute Lethality Toxicity  
 Test Protocol. OME, 1988)

Test Animal : D. magna  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	02:45 44:30	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890005

TEST CONC. %  
 ELAPSED TIME  
 02:45 44:30

100	pH 8.0 O2 ppm 9.6 Cond. 290 Temp(C) 20.0	7.8 8.9 270 20.0
50	pH 8.1 O2 ppm 9.6 Cond. 344 Temp(C) 20.0	8.0 8.8 440 20.0
26	pH 8.1 O2 ppm 9.6 Cond. 490 Temp(C) 20.0	8.1 8.9 500 20.0
13	pH 8.2 O2 ppm 9.6 Cond. 520 Temp(C) 20.0	8.1 9.0 540 20.0
6	pH 8.2 O2 ppm 9.4 Cond. 520 Temp(C) 20.0	8.1 8.9 560 20.0
Control	pH 8.1 O2 ppm 9.8 Cond. 560 Temp(C) 20.0	8.1 9.0 560 20.0

## MUSA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890039

## TEST CONDITIONS

Company : Shell Canada Products Limited  
Sarnia, ONT  
(510107)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : CW from POW, (500)  
Laboratory : Polutech  
Sampling Method : Grab  
Sampled By : T. Moran  
Date Collected : 05/08/89  
Date Received : 05/08/89  
Tested : 05/09/89 at: 1200

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol. ONE, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
100	0	2	16
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control			0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890039

TEST CONC. %  
ELAPSED TIME  
00:00 49:15

100	pH 7.9 O2 ppm 9.2 Cond. 254 Temp(C) 20.0	7.8 8.4 268 20.0
50	pH 8.0 O2 ppm 9.0 Cond. 372 Temp(C) 20.0	7.9 8.4 384 20.0
26	pH 8.0 O2 ppm 8.8 Cond. 440 Temp(C) 20.0	8.0 8.6 450 20.0
13	pH 8.0 O2 ppm 8.8 Cond. 440 Temp(C) 20.0	8.0 8.6 460 20.0
6	pH 8.0 O2 ppm 8.8 Cond. 480 Temp(C) 20.0	8.0 8.6 498 20.0

Control pH  
O2 ppm  
Cond.  
Temp(C)

SLOPE of Mortality Curve : none  
 LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890006

## TOXICITY TEST PARAMETERS

## TEST CONDITIONS

Company : Shell Canada Products Limited

Region : Sarnia, ONT

Industry : Southwest

Control point : Petroleum Refining

Laboratory : CW to POW, (800)

Sampling Method : Pollutech

Sampled By : Grab

Date Collected : T. Moran

Received : 01/16/89

Tested : 01/16/89

Type of Bioassay : STATIC

(Daphnia magna Acute Lethality Toxicity  
 Test Protocol, ONE, 1988)

Test Animal : D. magna

Weight(gm) :

Length(mm) :

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
100	0	00:00 49:00	%
50	0		0
26	0		0
13	0		0
6	0		0
Control	0		0

48 Hour LC50 : Non-Lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

Sample Number: 05890006

TEST CONC.  
 %

ELAPSED TIME

00:00 49:00

100	pH	7.8	7.9
	02 ppm	9.0	9.6
	Cond.	270	279
	Temp(C)	20.0	20.0
50	pH	7.9	7.9
	02 ppm	8.8	9.6
	Cond.	430	430
	Temp(C)	20.0	20.0
26	pH	8.0	8.0
	02 ppm	8.8	9.5
	Cond.	490	510
	Temp(C)	20.0	20.0
13	pH	8.0	8.0
	02 ppm	8.8	9.6
	Cond.	520	580
	Temp(C)	20.0	20.0
6	pH	8.0	8.0
	02 ppm	8.8	9.6
	Cond.	520	580
	Temp(C)	20.0	20.0
Control	pH	8.0	8.0
	02 ppm	9.0	9.6
	Cond.	580	600
	Temp(C)	20.0	20.0



COMPANY: Suncor Inc., Sarnia  
(490102)  
(now with Sunoco Division)  
SECTOR: Petroleum Refining  
REGION: Southwest

#### SUMMARY

The data for six trout bioassays, conducted on process effluent samples collected between December 1988 and May 1989, were provided by Suncor Incorporated. All six process effluent samples were determined to have been non-acutely lethal to test fish. Trout bioassays conducted on intake water samples collected during the same period were determined to have been non-acutely lethal. Data for one trout bioassay conducted on a cooling water sample collected in March 1989 indicate the sample was not acutely lethal.

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#### intake water

05880004	sampled: 12/12/88	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:		
05890003	sampled: 01/09/89	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:		
05890014	sampled: 02/06/89	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:		
05890023	sampled: 03/06/89	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:		
05890030	sampled: 04/03/89	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:		
05890035	sampled: 05/01/89	non-lethal
95% fid. limits:	0.0 -	0.0 %
comments:		

Suncor Inc. (continued)

Process Effluent

05880003 sampled: 12/12/88 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890002 sampled: 01/09/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890013 sampled: 02/06/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890024 sampled: 03/06/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

01890032 sampled: 03/29/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA audit sample

05890029 sampled: 04/03/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890034 sampled: 05/01/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

cooling water

05880005 sampled: 12/12/88 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890025 sampled: 03/06/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

01890033 sampled: 03/29/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA audit sample

landfarm leachate

Suncor Inc. (continued)

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05880004

## TOXICITY TEST PARAMETERS

## TEST CONDITIONS

Company : Suncor Inc.  
Sarnia, ONT  
(490102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : intake water, (100)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : T. Moran  
Date Collected : 12/12/88  
Received : 12/12/88  
Tested : 12/13/88 at: 1130

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E										TOTAL MORTALITY
%	00:00	02:10	03:10	05:00	22:10	46:25	70:25	95:10	%		
100	0	0	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments :

Sample Number: 05880004

## E L A P S E D T I M E

TEST  
CONC.  
%

00:00 02:10 03:10 05:00 22:10 46:25 70:25 95:10

100	pH 02 ppm Cond. Temp(C)	7.6 10.4 315 15.0	7.7 10.2 320 15.0	7.7 10.2 320 15.0	7.7 10.2 320 15.0	7.7 10.2 320 15.0	7.7 10.2 320 15.0
75	pH 02 ppm Cond. Temp(C)	7.5 10.3 275 15.0	7.8 10.1 285 15.0	7.8 10.3 285 15.0	7.8 10.3 285 15.0	7.8 10.3 285 15.0	7.8 10.3 285 15.0
56	pH 02 ppm Cond. Temp(C)	7.3 10.3 250 15.0	7.8 10.2 253 15.0	7.8 10.2 253 15.0	7.8 10.2 253 15.0	7.8 10.2 253 15.0	7.8 10.2 253 15.0
25	pH 02 ppm Cond. Temp(C)	7.2 10.2 206 15.0	7.8 9.9 205 15.0	7.8 9.9 205 15.0	7.8 9.9 205 15.0	7.8 9.9 205 15.0	7.8 9.9 205 15.0
10	pH 02 ppm Cond. Temp(C)	7.2 10.0 165 15.0	7.7 9.9 170 15.0	7.7 9.9 170 15.0	7.7 9.9 170 15.0	7.7 9.9 170 15.0	7.7 9.9 170 15.0
1	pH 02 ppm Cond. Temp(C)	7.1 10.2 160 15.0	7.8 9.9 160 15.0	7.8 9.9 160 15.0	7.8 9.9 160 15.0	7.8 9.9 160 15.0	7.8 9.9 160 15.0
Control	pH 02 ppm Cond. Temp(C)	7.0 10.2 162 15.0	7.7 10.1 168 15.0	7.6 10.2 168 15.0	7.6 10.2 168 15.0	7.6 10.2 168 15.0	7.6 10.2 168 15.0
Control	pH 02 ppm Cond. Temp(C)	7.1 10.3 162 15.0	7.6 10.1 168 15.0	7.6 10.1 168 15.0	7.6 10.1 168 15.0	7.6 10.1 168 15.0	7.6 10.1 168 15.0

## TOXICITY TEST REPORT

Sample: 05890003

## TEST CONDITIONS

Company : Suncor Inc.  
Sarnia, ONT  
(490102)  
Region : Southwest Refining  
Industry : Petroleum Refining  
Control point : Intake water, (100)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : T. Moran  
Date Collected : 01/09/89  
Received : 01/09/89  
Tested : 01/12/89 at: 1130

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish, ONE, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC. : 00:00 23:00 47:10 71:10 96:10

ELAPSED TIME : TOTAL MORTALITY %

TEST CONC.	00:00	23:00	47:10	71:10	96:10	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890003

TEST CONC. % : 00:00 23:00 47:10 71:10 96:10

ELAPSED TIME

TEST CONC. %	00:00	23:00	47:10	71:10	96:10
100	pH 7.7 O2 ppm 10.5 Cond. 318 Temp(C) 15.0	7.7 10.1 15.0	7.8 10.1 15.0	7.8 9.9 15.0	7.8 9.8 312 15.0
75	pH 7.7 O2 ppm 10.6 Cond. 380 Temp(C) 15.0	7.7 10.6 15.0	7.8 10.0 15.0	7.8 9.9 15.0	7.8 9.8 278 15.0
56	pH 7.7 O2 ppm 10.4 Cond. 260 Temp(C) 15.0	7.7 10.4 15.0	7.8 10.0 15.0	7.8 10.0 15.0	7.8 10.0 248 15.0
25	pH 7.7 O2 ppm 10.4 Cond. 205 Temp(C) 15.0	7.7 10.4 15.0	7.7 10.1 15.0	7.7 9.9 15.0	7.8 10.0 202 15.0
10	pH 7.7 O2 ppm 10.6 Cond. 180 Temp(C) 15.0	7.7 10.6 15.0	7.7 10.3 15.0	7.7 9.9 15.0	7.8 10.0 170 15.0
1	pH 7.7 O2 ppm 10.5 Cond. 170 Temp(C) 15.0	7.7 10.5 15.0	7.7 10.4 15.0	7.7 10.0 15.0	7.7 9.8 166 15.0
Control	pH 7.7 O2 ppm 10.6 Cond. 165 Temp(C) 15.0	7.7 10.6 15.0	7.6 10.2 15.0	7.8 9.9 15.0	7.7 10.2 164 15.0
Control	pH 7.7 O2 ppm 10.4 Cond. 165 Temp(C) 15.0	7.7 10.4 15.0	7.6 10.3 15.0	7.7 10.1 15.0	7.7 10.0 164 15.0

## MTSA-PETROLEUM-FISH

SLOPE of Mortality Curve : none  
LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 05890014

## TEST CONDITIONS

Company : Suncor Inc.  
Sarnia, ONT  
(490102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : intake water, (100)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : C. Ferguson  
Date Collected : 02/06/89  
Date Released : 02/06/89  
Date Tested : 02/07/89 at: 1130

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish, OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	26:10	50:00	75:10	96:00	%
100	0	0	0	0	0	0
75	0	0	0	0	0	0
50	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890014

TEST CONC. %

E L A P S E D T I M E

00:00 26:10 50:00 75:10 96:00

100	pH	7.7	7.7	7.6	7.6	7.6
	O2 ppm	10.2	9.6	9.6	9.0	10.1
	Cond.	282				292
	Temp(C)	15.0	15.0	15.0	15.0	15.0
75	pH	7.6	7.7	7.6	7.6	7.6
	O2 ppm	10.4	9.6	9.6	9.6	10.1
	Cond.	252				262
	Temp(C)	15.0	15.0	15.0	15.0	15.0
56	pH	7.6	7.7	7.6	7.6	7.6
	O2 ppm	10.2	9.6	9.6	9.5	10.1
	Cond.	232				242
	Temp(C)	15.0	15.0	15.0	15.0	15.0
25	pH	7.5	7.7	7.6	7.6	7.6
	O2 ppm	10.2	9.6	9.6	9.6	9.8
	Cond.	194				208
	Temp(C)	15.0	15.0	15.0	15.0	15.0
10	pH	7.5	7.6	7.5	7.5	7.6
	O2 ppm	10.2	9.4	9.4	9.6	9.8
	Cond.	168				190
	Temp(C)	15.0	15.0	15.0	15.0	15.0
1	pH	7.4	7.6	7.5	7.6	7.6
	O2 ppm	10.4	9.2	9.2	9.7	10.2
	Cond.	166				179
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.4	7.5	7.3	7.5
	O2 ppm	10.0	9.9	9.9	9.8	10.2
	Cond.	178				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.5	7.5	7.4	7.5
	O2 ppm	10.0	9.8	9.8	9.9	10.2
	Cond.	178				178
	Temp(C)	15.0	15.0	15.0	15.0	15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none  
LC50 Calculated By :

## TOXICITY TEST REPORT

Sample: 05890023

## TEST CONDITIONS

Company : Suncor Inc.  
Sarnia, ONT  
(490102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : intake water, (100)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : Grab  
Date Collected : 03/06/89  
Received : 03/06/89  
Tested : 03/07/89 at: 1530

## Type of Bioassay

: STATIC  
: (Protocol to determine the acute lethality  
: of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(cm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	20:00	49:10	68:00	94:10	%
100	0	0	0	1	1	10
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890023

TEST CONC. %	E L A P S E D T I M E				
	00:00	20:00	49:10	68:00	94:10
100	pH	7.8	7.8	7.7	7.7
	O2 ppm	10.5	9.2	9.9	9.9
	Cond.	310	310	310	315
	Temp(C)	15.0	15.0	15.0	15.0
100	pH	7.8	7.7	7.7	7.8
	O2 ppm	10.6	9.2	9.9	10.1
	Cond.	310	310	310	315
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.6	7.5	7.6	7.7
	O2 ppm	10.0	9.8	10.1	10.2
	Cond.	168	168	168	178
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.6	7.5	7.6	7.7
	O2 ppm	9.9	9.6	9.8	10.2
	Cond.	168	168	168	178
	Temp(C)	15.0	15.0	15.0	15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none  
 LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 05890030

## TEST CONDITIONS

Company : Suncor Inc.  
 : Sarnia, ONT  
 : (490102)  
 Region : Southwest  
 : Petroleum Refining  
 Industry :  
 Control point : intake water, (100)  
 Laboratory : Pollutech  
 : Grab  
 Sampling Method : C. Ferguson  
 :  
 Sampled By :  
 Date Collected : 04/03/89  
 Received :  
 Tested : 04/04/89 at: 1330

Type of Bioassay : STATIC  
 : (Protocol to determine the acute lethality  
 : of liquid effluents to fish. OME, 1983).

Test Animal :  
 Weight(gm) :  
 Length(mm) :  
 : Rainbow trout

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	19:15	46:10	69:00	95:10	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal  
 95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890030

TEST CONC. %	E L A P S E D T I M E				
	00:00	19:15	46:10	69:00	95:10
100	pH	7.6	7.6	7.5	7.6
	O2 ppm	10.2	8.4	9.8	9.9
	Cond.	310	15.0	15.0	15.0
100	Temp(C)	15.0	15.0	15.0	15.0
	pH	7.6	7.4	7.4	7.5
	O2 ppm	10.2	9.2	9.7	9.5
Control	Cond.	312	15.0	15.0	15.0
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.6	7.3	7.6	7.5
	O2 ppm	10.2	9.2	10.1	9.9
	Cond.	162	15.0	15.0	15.0
Control	Temp(C)	15.0	15.0	15.0	15.0
	pH	7.6	7.4	7.6	7.4
	O2 ppm	10.2	9.2	10.2	10.0
Control	Cond.	162	15.0	15.0	15.0
	Temp(C)	15.0	15.0	15.0	15.0

## TOXICITY TEST REPORT      Sample: 05890035

TEST CONDITIONS

Company : Sunco Inc.  
           : Sarnia, ONT  
           : (490102)  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : intake water, (100)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : C. Ferguson  
 Date Collected : 05/01/89  
 Received : 05/01/89  
 Tested : 05/02/89 at: 1400

Type of Bioassay : STATIC  
 (Protocol to determine the acute lethality  
 of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
 Weight(gm) :  
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D   T I M E						TOTAL MORTALITY
%	00:00	21:30	47:30	72:30	97:30		%
100	0	0	0	0	0		0
100	0	0	0	0	0		0
Control	0	0	0	0	0		0
Control	0	0	0	0	0		0

96 Hour LC50 : Non-lethal  
 95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890035

TEST CONC. %	E L A P S E D   T I M E					
	00:00	21:30	47:30	72:30	97:30	
100	pH 7.7 O2 ppm 9.8 Cond. 278 Temp(C) 15.0	7.8 9.8 15.0	7.6 8.8 15.0	7.6 9.1 15.0	7.5 9.6 298	
100	pH 7.7 O2 ppm 10.0 Cond. 278 Temp(C) 15.0	7.7 9.9 278 15.0	7.6 8.9 9.3 15.0	7.6 9.3 9.6 15.0	7.3 9.6 288 15.0	
Control	pH 7.3 O2 ppm 10.6 Cond. 158 Temp(C) 15.0	7.3 9.8 158 15.0	7.6 9.3 9.3 15.0	7.6 9.8 10.1 15.0	7.3 10.1 172 15.0	
Control	pH 7.3 O2 ppm 10.4 Cond. 170 Temp(C) 15.0	7.3 10.4 170 15.0	7.6 9.4 9.4 15.0	7.5 9.9 170 15.0	7.3 10.0 170 15.0	

## MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05880003

## TEST CONDITIONS

Company : Suncor Inc.  
Sarnia, ONT  
(490102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Process Effluent, (300)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : J. Moran  
Date Collected : 12/12/88  
Received : 12/12/88  
Tested : 12/13/88 at: 1130

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E								TOTAL MORTALITY
%	00:00	02:10	03:10	05:00	22:10	46:10	70:00	95:10	%
100	0	0	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :  
LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 05880003

TEST  
CONC. %

E L A P S E D T I M E

00:00 02:10 03:10 05:00 22:10 46:10 70:00 95:10

100	pH	7.2	7.5	7.6	7.5	7.6	7.5
	O2 ppm	9.8	9.4	9.8	9.9	9.9	10.0
	Cond.	1290	15.0	15.0	15.0	15.0	15.0
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
75	pH	7.2	7.5	7.6	7.6	7.6	7.6
	O2 ppm	9.9	9.6	9.8	10.1	10.0	10.0
	Cond.	1000	15.0	15.0	15.0	15.0	15.0
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
56	pH	7.2	7.5	7.7	7.6	7.6	7.6
	O2 ppm	10.2	9.8	9.8	10.2	10.0	10.0
	Cond.	820	15.0	15.0	15.0	15.0	15.0
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
25	pH	7.2	7.6	7.7	7.7	7.7	7.7
	O2 ppm	10.4	9.7	9.9	10.0	10.0	10.0
	Cond.	430	15.0	15.0	15.0	15.0	15.0
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
10	pH	7.3	7.6	7.7	7.7	7.7	7.7
	O2 ppm	10.8	9.8	9.9	10.1	10.0	10.0
	Cond.	280	15.0	15.0	15.0	15.0	15.0
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
1	pH	7.3	7.5	7.8	7.7	7.7	7.7
	O2 ppm	10.8	9.8	9.8	10.1	10.2	10.2
	Cond.	172	15.0	15.0	15.0	15.0	15.0
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
Control	pH	7.0	7.6	7.7	7.6	7.6	7.6
	O2 ppm	10.2	10.0	10.0	10.1	10.2	10.2
	Cond.	162	15.0	15.0	15.0	15.0	15.0
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
Control	pH	7.1	7.6	7.6	7.6	7.6	7.6
	O2 ppm	10.3	9.9	10.1	10.1	10.1	10.1
	Cond.	162	15.0	15.0	15.0	15.0	15.0
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890002

## TEST CONDITIONS

Company : Suncor Inc.  
Region : Sarnia, ONT  
Industry : Southwest  
Control point : Petroleum Refining  
Laboratory : Pollutec  
Sampling Method : Grab  
Sampled By : T. Moran  
Date Collected : 01/09/89  
Received : 01/09/89  
Tested : 01/12/89 at: 1130

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(cm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME						TOTAL MORTALITY
%	00:00	23:00	47:10	71:10	96:10	%	%
100	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890002

TEST CONC. %  
ELAPSED TIME  
00:00 23:00 47:10 71:10 96:10

100	pH 02 ppm Cond. Temp(C)	6.6 9.8 1120 15.0	6.8 9.5 1120 15.0	6.9 9.7 1080 15.0	6.9 9.7 1080 15.0
75	pH 02 ppm Cond. Temp(C)	7.0 9.9 980 15.0	7.3 9.5 980 15.0	7.2 10.0 9.8 15.0	7.3 9.8 900 15.0
56	pH 02 ppm Cond. Temp(C)	7.2 10.0 700 15.0	7.5 9.4 700 15.0	7.4 10.2 700 15.0	7.5 9.9 700 15.0
25	pH 02 ppm Cond. Temp(C)	7.6 10.4 442 15.0	7.6 9.8 442 15.0	7.6 10.2 448 15.0	7.6 9.9 448 15.0
10	pH 02 ppm Cond. Temp(C)	7.7 10.4 365 15.0	7.7 10.0 365 15.0	7.7 9.4 362 15.0	7.7 9.9 362 15.0
1	pH 02 ppm Cond. Temp(C)	7.7 10.4 175 15.0	7.7 10.4 175 15.0	7.7 9.8 176 15.0	7.7 10.0 176 15.0
Control	pH 02 ppm Cond. Temp(C)	7.7 10.6 165 15.0	7.6 10.2 165 15.0	7.8 10.2 164 15.0	7.7 9.9 164 15.0
Control	pH 02 ppm Cond. Temp(C)	7.7 10.4 165 15.0	7.6 10.3 165 15.0	7.6 10.2 164 15.0	7.7 10.0 164 15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none  
LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 058900013

## TEST CONDITIONS

Company : Suncor Inc.  
(490102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Process Effluent, (300)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : C. Ferguson  
Date Collected : 02/06/89  
Received : 02/06/89  
Tested : 02/07/89 at: 1630

## Type of Bioassay

: STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. OME, 1983).

Test Animal  
Weight(gm)  
Length(mm)

: Rainbow trout  
:

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
	%	00:00	21:10	45:00	70:10 95:00	
100	0	0	0	0	0	0
75	0	0	0	0	0	0
56	0	0	0	0	0	0
25	0	0	0	0	0	0
10	0	0	0	0	0	0
1	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 058900013

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 21:10 45:00 70:10 95:00

100	pH 02 ppm Cond. Temp(C)	7.1 9.6 1000 15.0	7.3 9.5 9.4 15.0	7.3 9.4 9.5 15.0	7.4 9.5 1050 15.0
75	pH 02 ppm Cond. Temp(C)	7.2 9.9 800 15.0	7.4 9.5 9.2 15.0	7.4 9.5 9.5 15.0	7.4 9.5 860 15.0
56	pH 02 ppm Cond. Temp(C)	7.3 10.4 650 15.0	7.5 9.5 9.2 15.0	7.5 9.8 9.8 15.0	7.5 9.8 890 15.0
25	pH 02 ppm Cond. Temp(C)	7.4 10.8 350 15.0	7.7 9.6 9.0 15.0	7.6 9.0 9.6 15.0	7.5 9.4 372 15.0
10	pH 02 ppm Cond. Temp(C)	7.5 11.0 240 15.0	7.6 9.3 9.4 15.0	7.4 9.4 9.4 15.0	7.4 9.2 260 15.0
1	pH 02 ppm Cond. Temp(C)	7.4 11.0 170 15.0	7.6 9.2 9.2 15.0	7.3 9.8 225 15.0	7.3 9.2 225 15.0
Control	pH 02 ppm Cond. Temp(C)	7.3 10.8 162 15.0	7.7 9.8 9.9 15.0	7.4 9.9 10.0 15.0	7.6 9.7 172 15.0
Control	pH 02 ppm Cond. Temp(C)	7.3 11.0 162 15.0	7.6 9.8 9.8 15.0	7.5 9.9 9.9 15.0	7.6 9.7 172 15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890024

TEST CONDITIONS

Company : Suncor Inc.  
 : Sarnia, ONT  
 : (490102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Process Effluent, (300)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : C. Ferguson  
Date Collected : 03/06/89  
Received : 03/06/89  
Tested : 03/07/89 at: 1530

Type of Bioassay

: STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. DRE, 1983).

Test Animal  
Weight (gm)  
Length (mm)

: Rainbow trout  
:  
:

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	20:00	40:10	68:00	94:10	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890024

TEST CONC.	E L A P S E D T I M E				
%	00:00	20:00	40:10	68:00	94:10
100	pH	7.0	7.3	7.3	7.2
	O <sub>2</sub> ppm	9.0	9.4	9.6	10.0
	Cond.	1180			1160
	Temp(C)	15.0	15.0	15.0	15.0
100	pH	7.0	7.1	7.2	7.2
	O <sub>2</sub> ppm	8.9	9.6	9.5	10.1
	Cond.	1180			1140
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.6	7.5	7.6	7.5
	O <sub>2</sub> ppm	10.8	9.8	10.1	10.2
	Cond.	1688			1778
	Temp(C)	15.0	15.0	15.0	15.0
Control	pH	7.6	7.5	7.6	7.4
	O <sub>2</sub> ppm	9.9	9.6	9.8	10.3
	Cond.	1668			1778
	Temp(C)	15.0	15.0	15.0	15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :  
LC50 Calculated By :

Sample: 01890032

## TOXICITY TEST REPORT

## TEST CONDITIONS

Company : Suncor Inc.  
Sarnia, ONT  
(490102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Process Effluent, (300)  
Laboratory : MOE  
Sampling Method : grab  
Sampled By : D. Hamilton  
Date Collected : 03/29/89  
Received : 03/30/89  
Tested : 03/30/89 at: 1500

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY
%	00:00	00:30	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments : MISA audit sample

## TOXICITY TEST PARAMETERS

Sample Number: 01890032

TEST CONC. %  
E L A P S E D T I M E  
00:00 00:30 24:00 48:00 72:00 96:00

100	pH 7.2 02 ppm 8.7 Cond. 870 Temp(C) 15.0	7.5 9.6 9.6 870 15.0	7.8 9.6 9.7 900 15.0	7.8 9.7 880 15.0	7.7 9.2 875 15.0
65	pH 7.7 02 ppm 9.8 Cond. 670 Temp(C) 15.0	7.9 9.8 9.8 660 15.0	7.8 10.0 650 15.0	7.7 9.3 650 15.0	7.7 9.7 660 15.0
40	pH 7.8 02 ppm 9.7 Cond. 510 Temp(C) 15.0	7.9 9.7 10.0 520 15.0	7.8 9.2 515 15.0	7.6 9.2 520 15.0	7.7 9.5 520 15.0
30	pH 7.7 02 ppm 9.7 Cond. 470 Temp(C) 15.0	7.8 9.7 10.0 470 15.0	7.7 9.3 465 15.0	7.7 9.3 460 15.0	7.6 9.5 465 15.0
20	pH 7.9 02 ppm 9.7 Cond. 405 Temp(C) 15.0	7.9 9.3 10.0 410 15.0	7.8 9.4 405 15.0	7.7 9.4 405 15.0	7.7 9.4 410 15.0
10	pH 8.0 02 ppm 9.8 Cond. 355 Temp(C) 15.0	7.9 9.4 10.0 365 15.0	7.8 9.4 360 15.0	7.5 9.4 360 15.0	7.6 9.4 365 15.0
Control	pH 7.6 02 ppm 9.7 Cond. 260 Temp(C) 15.0	7.8 9.8 9.8 260 15.0	7.8 9.7 260 15.0	7.9 9.7 260 15.0	7.9 9.7 260 15.0

## TOXICITY TEST REPORT Sample: 05890029

TEST CONDITIONS

Company : Suncor Inc.  
 Region : Sarnia, ONT (490102)  
 Industry : Southwest  
 : Petroleum Refining  
 Control point : Process Effluent, (300)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : C. Ferguson  
 Date Collected : 04/03/89  
 Received : 04/03/89  
 Tested : 04/04/89 at: 1330  
 Type of Bioassay : STATIC  
 (Protocol to determine the acute lethality  
 of liquid effluents to fish. DME, 1983).  
 Test Animal : Rainbow trout  
 Weight(gm) :  
 Length(mm) :

MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY
%	00:00	19:15	46:10	69:00	95:10	%	
100	0	0	0	0	0	0	0
100	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal  
 95% fid. limits : 0.0 - 0.0 %  
 Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890029

TEST CONC. %	E L A P S E D T I M E					
	00:00	19:15	46:10	69:00	95:10	
100	pH 7.3	7.4	7.4	7.4	7.5	
	O2 ppm 8.6	8.6	9.4	9.4	9.6	
	Cond. 960				960	
	Temp(C) 15.0	15.0	15.0	15.0	15.0	
100	pH 7.3	7.5	7.4	7.4	7.6	
	O2 ppm 8.5	8.8	9.6	9.4	9.4	
	Cond. 960				960	
	Temp(C) 15.0	15.0	15.0	15.0	15.0	
Control	pH 7.6	7.3	7.6	7.3	7.5	
	O2 ppm 10.2	9.2	10.1	9.9	10.0	
	Cond. 162				172	
	Temp(C) 15.0	15.0	15.0	15.0	15.0	
Control	pH 7.6	7.4	7.6	7.4	7.5	
	O2 ppm 10.2	9.2	10.2	10.0	10.0	
	Cond. 162				170	
	Temp(C) 15.0	15.0	15.0	15.0	15.0	

## MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 05890034

## TEST CONDITIONS

Company : Suncor Inc.  
 : Sarnia, ONT  
 (490102)  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (300)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : C. Ferguson  
 Date Collected : 05/01/89  
 Received : 05/01/89  
 Tested : 05/02/89 at: 1400

## Type of Bioassay

: STATIC  
 (Protocol to determine the acute lethality  
 of liquid effluents to fish, OME, 1985).

Test Animal :  
 Weight(gm) :  
 Length(mm) :  
 : Rainbow trout  
 :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	21:30	47:30	72:30	97:30	%
100	0	0	0	0	0	0
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve : none  
 LC50 Calculated by :

## TOXICITY TEST PARAMETERS

Sample Number: 05890034

TEST CONC. %  
 E L A P S E D T I M E  
 00:00 21:30 47:30 72:30 97:30

100	pH	7.1	7.3	7.3	7.2	7.1
	O2 ppm	8.5	8.5	8.4	9.1	9.5
	Cond.	1100				1100
	Temp(C)	15.0	15.0	15.0	15.0	15.0
100	pH	7.1	7.2	7.2	7.2	7.0
	O2 ppm	8.5	8.4	8.3	9.2	9.6
	Cond.	1100				1090
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.6	7.6	7.6	7.3
	O2 ppm	10.6	9.8	9.3	9.8	10.1
	Cond.	158				172
	Temp(C)	15.0	15.0	15.0	15.0	15.0
Control	pH	7.3	7.6	7.6	7.5	7.3
	O2 ppm	10.4	10.0	9.4	9.9	10.0
	Cond.	158				170
	Temp(C)	15.0	15.0	15.0	15.0	15.0

SLOPE of Mortality Curve :  
LC50 Calculated By :

Sample: 05880005

## TOXICITY TEST REPORT

## TEST CONDITIONS

Company : Sunco Inc.  
Sarnia, ONT  
(490102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : cooling water, (400)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : T. Moran  
Date Collected : 12/12/88  
Received : 12/12/88  
Tested : 12/13/88 at: 1130

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. DME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY	
%	00:00	02:10	03:10	05:00	22:10	46:25	70:25 95:25
100	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05880005

TEST CONC. %

E L A P S E D T I M E

00:00 02:10 03:10 05:00 22:10 46:25 70:25 95:25

100	pH 02 ppm Cond. Temp(C)	7.6 10.1 320 15.0	7.8 9.6 15.0	7.7 10.2 15.0	7.8 9.8 15.0	7.8 10.2 15.0	7.8 10.2 15.0
75	pH 02 ppm Cond. Temp(C)	7.5 10.2 280 15.0	7.7 9.5 15.0	7.7 9.8 15.0	7.8 10.1 15.0	7.8 10.1 15.0	7.8 10.1 15.0
56	pH 02 ppm Cond. Temp(C)	7.3 10.0 250 15.0	7.7 9.6 15.0	7.7 9.9 15.0	7.8 10.2 15.0	7.8 10.2 15.0	7.8 10.2 15.0
25	pH 02 ppm Cond. Temp(C)	7.2 10.0 190 15.0	7.7 9.7 15.0	7.7 10.1 15.0	7.7 10.2 15.0	7.7 10.2 15.0	7.7 10.2 15.0
10	pH 02 ppm Cond. Temp(C)	7.1 10.0 175 15.0	7.6 9.8 15.0	7.7 10.0 15.0	7.7 10.1 15.0	7.7 10.2 15.0	7.7 10.2 15.0
1	pH 02 ppm Cond. Temp(C)	7.1 9.9 155 15.0	7.6 9.8 15.0	7.7 10.0 15.0	7.7 10.1 15.0	7.7 10.2 15.0	7.7 10.2 15.0
Control	pH 02 ppm Cond. Temp(C)	7.0 10.2 162 15.0	7.6 10.0 15.0	7.7 10.0 15.0	7.6 10.1 15.0	7.6 10.2 15.0	7.6 10.2 15.0
Control	pH 02 ppm Cond. Temp(C)	7.1 10.3 162 15.0	7.6 9.9 15.0	7.6 10.1 15.0	7.6 10.2 15.0	7.6 10.2 15.0	7.6 10.2 15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : none  
 LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 05890025

## TEST CONDITIONS

Company : Suncor Inc.  
 Sarnia, ONT  
 (490102)  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : cooling water, (400)  
 Laboratory : Pollutech  
 Sampling Method : grab  
 Sampled By : C. Ferguson  
 Date Collected : 03/06/89  
 Received : 03/06/89  
 Tested : 03/07/89 at: 1520

Type of Bioassay : STATIC  
 (protocol to determine the acute lethality  
 of liquid effluents to fish. ONE, 1983).

Test Animal : Rainbow trout  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E						TOTAL MORTALITY
%	00:00	20:10	49:20	68:10	95:10		%
100	0	0	0	0	0	0	0
75	0	0	0	0	0	0	0
56	0	0	0	0	0	0	0
25	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
1	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal  
 95% fid. limits : 0.0 - 0.0 %  
 Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890025

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 20:10 49:20 68:10 95:10

100	pH 02 ppm Cond. Temp(C)	7.7 9.8 318 15.0	7.8 9.6 15.0	7.7 9.8 15.0	7.7 10.2 15.0	7.7 9.9 315 15.0
75	pH 02 ppm Cond. Temp(C)	7.7 9.8 280 15.0	7.8 9.4 280 15.0	7.7 9.7 15.0	7.7 10.2 15.0	7.7 9.8 280 15.0
56	pH 02 ppm Cond. Temp(C)	7.7 9.7 250 15.0	7.8 9.4 250 15.0	7.7 9.7 15.0	7.7 10.0 15.0	7.7 10.1 252 15.0
25	pH 02 ppm Cond. Temp(C)	7.6 9.6 202 15.0	7.7 9.4 202 15.0	7.7 9.6 15.0	7.7 10.0 15.0	7.7 9.8 208 15.0
10	pH 02 ppm Cond. Temp(C)	7.6 10.0 180 15.0	7.7 9.2 180 15.0	7.7 9.9 15.0	7.6 9.8 15.0	7.7 9.5 188 15.0
1	pH 02 ppm Cond. Temp(C)	7.5 9.9 170 15.0	7.8 9.6 170 15.0	7.8 9.8 15.0	7.7 10.2 15.0	7.7 9.8 182 15.0
Control	pH 02 ppm Cond. Temp(C)	7.6 10.0 168 15.0	7.5 9.8 168 15.0	7.6 10.1 15.0	7.5 10.2 15.0	7.7 10.2 178 15.0
Control	pH 02 ppm Cond. Temp(C)	7.6 9.9 168 15.0	7.5 9.6 168 15.0	7.6 9.8 15.0	7.6 10.2 15.0	7.7 10.3 173 15.0

## TOXICITY TEST REPORT Sample: 01890033

## TEST CONDITIONS

Company : Suncor Inc.  
Sarnia, ONT  
(490102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : cooling water, (400)  
Laboratory : MOE  
Sampling Method : grab  
Sampled By : D. Hamilton  
Date Collected : 03/29/89  
Received : 03/30/89  
Tested : 03/30/89 at: 1500

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(cm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME						TOTAL MORTALITY
%	00:00	00:30	24:00	48:00	72:00	96:00	
100	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : WISA audit sample

## TOXICITY TEST PARAMETERS

Sample Number: 01890033

TEST  
CONC.  
%

ELAPSED TIME

00:00 00:30 24:00 48:00 72:00 96:00

100	pH	7.8	8.1	7.8	7.8	7.6	7.7
	02 ppm	9.9	10.0	9.2	9.9	9.0	9.1
	Cond.	300	300	315	325	325	325
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
65	pH	8.1	7.6	7.6	7.4	7.4	7.6
	02 ppm	10.1	6.5	9.5	9.0	8.7	8.7
	Cond.	295	305	305	310	310	310
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
40	pH	8.0	7.7	7.7	7.6	7.8	7.8
	02 ppm	10.0	9.2	10.1	9.6	9.4	9.4
	Cond.	290	300	300	300	300	300
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
30	pH	8.0	7.6	7.6	7.6	7.6	7.7
	02 ppm	10.0	9.1	10.2	9.3	9.3	9.3
	Cond.	285	295	290	295	300	300
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
20	pH	8.0	7.4	7.5	7.5	7.6	7.6
	02 ppm	9.9	8.7	9.8	9.1	9.0	9.0
	Cond.	280	290	290	290	290	290
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
10	pH	7.9	6.8	7.4	7.3	7.4	7.4
	02 ppm	10.1	8.0	9.3	8.9	8.3	8.3
	Cond.	280	290	290	290	295	295
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
Control	pH	7.9	7.9	7.6	7.9	7.8	7.8
	02 ppm	9.7	9.6	9.7	9.7	9.7	9.7
	Cond.	260	260	260	260	260	260
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0



COMPANY: Suncor Inc., Sarnia  
(490102)  
(now with Sunoco Division)  
SECTOR: Petroleum Refining  
REGION: Southwest

#### SUMMARY

Data for 14 *Daphnia magna* acute lethality toxicity tests conducted on samples collected between December 1988 and May 1989 were submitted by Suncor Inc. in Sarnia. Six samples of Process Effluent were not acutely lethal to *Daphnia*.

Seven samples of Intake Water and one sample of Cooling Water were all not acutely lethal to *Daphnia*.

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#### intake water

05880004 sampled: 12/12/88 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890003 sampled: 01/09/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890014 sampled: 02/06/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890023 sampled: 03/06/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890030 sampled: 04/03/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890035 sampled: 05/01/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

#### Process Effluent

05880003 sampled: 12/12/88 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890002 sampled: 01/09/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

Suncor Inc. (continued)

05890013 sampled: 02/06/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890024 sampled: 03/06/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

02890032 sampled: 03/29/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA Audit

05890029 sampled: 04/03/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890034 sampled: 05/01/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

cooling water

05880005 sampled: 12/12/88 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

05890025 sampled: 03/06/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

02890033 sampled: 03/29/89 LC50: >100 %  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA Audit

landfarm leachate

TOXICITY TEST REPORT Sample: 05880004

## TEST CONDITIONS

Company : Suncor Inc.  
Sarnia, ONT  
(490102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : intake water, (100)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : Y. Sarnia  
Date Collected : 12/12/88  
Received : 12/12/88  
Tested : 12/14/88 at: 1000

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, OME, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
100	0	0	0
50	0	0	0
26	0	1	8
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :  
LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 05880004

TEST CONC. %  
ELAPSED TIME  
00:00 47:30

100	pH 02 ppm Cond. Temp(C)	7.8 10.4 300 20.0	7.8 9.3 370 20.0
50	pH 02 ppm Cond. Temp(C)	7.9 10.0 400 20.0	7.9 9.3 468 20.0
26	pH 02 ppm Cond. Temp(C)	8.1 9.8 500 20.0	8.0 9.3 500 20.0
13	pH 02 ppm Cond. Temp(C)	8.1 9.7 520 20.0	8.0 9.3 520 20.0
6	pH 02 ppm Cond. Temp(C)	8.1 9.5 640 20.0	8.0 9.3 600 20.0
Control	pH 02 ppm Cond. Temp(C)	8.1 9.5 660 20.0	8.0 9.2 600 20.0

## MTSA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 05890003

## TEST CONDITIONS

Company : Suncor Inc.  
Sarnia, ONT  
(490102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Intake water, (100)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : T. Moran  
Date Collected : 01/09/89  
Received : 01/09/89  
Tested : 01/09/89 at: 1530

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol. OME, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
100	0	00:00 48:10	0
50	0		0
26	0		0
13	0		0
6	0		8
Control	0		0

48 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890003

TEST CONC. %

ELAPSED TIME

00:00 48:10

100	pH 7.4	02 ppm 7.8	Cond. 10.2	360 8.8	Temp(C) 20.0	20.0
50	pH 7.8	02 ppm 7.8	Cond. 9.9	460 8.8	Temp(C) 20.0	20.0
26	pH 8.0	02 ppm 8.1	Cond. 9.8	520 8.8	Temp(C) 20.0	20.0
13	pH 8.1	02 ppm 8.1	Cond. 9.6	570 8.8	Temp(C) 20.0	20.0
6	pH 8.1	02 ppm 8.1	Cond. 9.6	590 8.9	Temp(C) 20.0	20.0
Control	pH 8.2	02 ppm 8.0	Cond. 9.4	590 9.2	Temp(C) 20.0	20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890014

## TEST CONDITIONS

Company : Suncor Inc.  
Sarnia, ONT  
(490102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : intake water, (100)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sample Collected : C. Ferguson  
Date Collected : 02/06/89  
Received : 02/06/89  
Tested : 02/06/89 at: 1715

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, OME, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY %
100	0	00:00 47:15	0
50	0		0
25	0		0
13	0		0
6	0		0
Control	0		0

48 Hour LC50 : Non-Lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890014

TEST CONC. %	ELAPSED TIME
100	00:00 47:15

TEST CONC. %	pH	O2 ppm	Cond.	Temp(C)
100	7.7	7.9	10.2	9.1
	288	320	20.0	20.0
50	7.9	8.0	8.8	9.0
	430	480	20.0	20.0
26	8.0	8.0	8.4	9.0
	490	520	20.0	20.0
13	8.0	8.0	8.0	9.0
	520	580	20.0	20.0
6	8.0	8.1	8.0	9.1
	520	600	20.0	20.0
Control	8.0	8.0	8.6	9.1
	540	600	20.0	20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
LC50 Calculated By :

Sample: 05890023

TOXICITY TEST REPORT

## TEST CONDITIONS

Company : Suncor Inc.  
Sarnia, ONT  
(490102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : intake water, (100)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : C Ferguson  
Date Collected : 03/06/89  
Received : 03/06/89  
Tested : 03/07/89 at: 1100  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, OME, 1988)  
Test Animal :  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
100	0	00:00 48:30	0
50	0		0
26	0		0
13	0		0
6	0		0
Control	0		0

48 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890023

TEST CONC.	%	ELAPSED TIME
100	0	00:00 48:30

100	pH	7.9	7.8
	O2 ppm	9.8	9.4
	Cond.	350	355
	Temp(C)	20.0	20.0
50	pH	8.0	7.9
	O2 ppm	9.4	9.4
	Cond.	452	465
	Temp(C)	20.0	20.0
26	pH	8.1	8.0
	O2 ppm	9.2	9.5
	Cond.	520	550
	Temp(C)	20.0	20.0
13	pH	8.1	8.0
	O2 ppm	9.2	9.5
	Cond.	550	580
	Temp(C)	20.0	20.0
6	pH	8.1	8.0
	O2 ppm	9.2	9.4
	Cond.	580	600
	Temp(C)	20.0	20.0
Control	pH	8.1	8.0
	O2 ppm	9.1	9.4
	Cond.	600	610
	Temp(C)	20.0	20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890030

TEST CONDITIONS

Company : Suncoar Inc.  
 : Sarnia, ONT  
 : (490102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : intake water, (100)  
Laboratory : Pollutech  
 : Grab  
Sampling Method : C. Ferguson  
Sampled By : 04/03/89  
Date Collected : 04/03/89  
Received : 04/04/89 at: 1515  
Tested :  
Type of Bioassay : STATIC  
 : (Daphnia magna Acute Lethality Toxicity  
 : Test Protocol, OME, 1988)  
 :  
 : D. magna  
Test Animal :  
Weight(gm) :  
Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890030

TEST CONC. %  
ELAPSED TIME  
00:00 48:20

100	pH 02 ppm Cond. Temp(C)	7.7 9.4 320 20.0	7.7 9.4 370 20.0
50	pH 02 ppm Cond. Temp(C)	7.8 9.4 420 20.0	7.8 9.4 450 20.0
26	pH 02 ppm Cond. Temp(C)	7.9 9.0 480 20.0	7.9 9.4 500 20.0
13	pH 02 ppm Cond. Temp(C)	8.0 8.8 500 20.0	7.9 9.2 520 20.0
6	pH 02 ppm Cond. Temp(C)	8.0 8.8 500 20.0	7.9 9.4 550 20.0
Control	pH 02 ppm Cond. Temp(C)	8.0 9.2 520 20.0	8.0 9.3 560 20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 05890035

## TEST CONDITIONS

Company : Suncor Inc.  
Sarnia, ONT  
(490102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Intake water, (100)  
Laboratory : Pollutech  
Sampling Method : Grab  
Date Collected : C. Ferguson  
Received : 05/01/89  
Tested : 05/01/89  
at: 1115

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, ONE, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
100	0	00:00 48:20	0
50	0		0
20	0		0
13	0		0
6	0		0
Control	0		0

48 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890035

TEST CONC. %  
ELAPSED TIME  
00:00 48:20

100	pH 02 ppm Cond. Temp(C)	7.8 10.4 308 20.0	7.8 8.5 338 20.0
50	pH 02 ppm Cond. Temp(C)	7.9 9.8 402 20.0	7.8 8.5 422 20.0
26	pH 02 ppm Cond. Temp(C)	8.0 9.8 448 20.0	7.9 8.5 452 20.0
13	pH 02 ppm Cond. Temp(C)	8.0 9.8 468 20.0	8.0 9.0 478 20.0
6	pH 02 ppm Cond. Temp(C)	8.0 9.6 470 20.0	8.0 9.2 478 20.0
Control	pH 02 ppm Cond. Temp(C)	8.0 9.8 490 20.0	8.0 9.2 510 20.0

SLOPE of Mortality Curve :  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05880003

## TEST CONDITIONS

Company : Suncor Inc.  
Sarnia, ONT  
(490102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Process Effluent, (300)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : T. Moran  
Date Collected : 12/12/88  
Received : 12/12/88  
Tested : 12/13/88 at: 1245

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol. ONE, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY %
100	01:00 46:25	0
50	0	0
26	0	0
13	0	0
6	0	8
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05880003

TEST CONC. %  
ELAPSED TIME  
01:00 46:25

100	pH 7.5 O2 ppm 7.6 Concl. 8.9 Temp(C) 1680 20.0 1680 20.0 20.0
50	pH 7.9 O2 ppm 7.9 Concl. 8.8 Temp(C) 1040 20.0 1050 20.0 20.0
26	pH 8.1 O2 ppm 8.1 Concl. 9.0 Temp(C) 820 20.0 820 20.0 20.0
13	pH 8.1 O2 ppm 8.1 Concl. 9.0 Temp(C) 700 20.0 700 20.0 20.0
6	pH 8.2 O2 ppm 8.1 Concl. 9.0 Temp(C) 640 20.0 650 20.0 20.0
Control	pH 8.2 O2 ppm 8.1 Concl. 9.0 Temp(C) 600 20.0 600 20.0 20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890002

## TEST CONDITIONS

Company : Suncor Inc.  
Sarnia, ONT  
(490102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Process Effluent, (300)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sample Collected : T. Moran  
Date Collected : 01/09/89  
Received : 01/09/89  
Tested : 01/10/89 at: 1215  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol. OME, 1988)  
Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY %
100	0	1	8
50	0	1	8
26	0	0	0
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890002

TEST CONC. %  
ELAPSED TIME  
00:00 47:15

TEST CONC. %	pH	O2 ppm	Cond.	Temp(C)
100	6.7	9.8	1220	6.8
			20.0	20.0
50	7.7	9.9	920	7.7
			20.0	20.0
26	8.0	9.7	790	8.0
			20.0	20.0
13	8.0	9.9	700	7.9
			20.0	20.0
6	8.1	9.9	650	8.0
			20.0	20.0
Control	8.0	9.9	590	7.9
			20.0	20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
 LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 05890013

## TEST CONDITIONS

Company : Suncor Inc.  
 : Sarnia, ONT  
 : (490102)  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (300)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled by : J. Ferguson  
 Date Collected : 02/06/89  
 Date Received : 02/06/89  
 Tested : 02/06/89 at: 1745

Type of Bioassay : STATIC  
 : (Daphnia magna Acute Lethality Toxicity  
 : Test Protocol, OME, 1988)

Test Animal : D. magna  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
100	0	00:10 48:10	0
50	0		0
26	0		0
13	0		0
6	0		0
Control	0		0

48 hour LC50 : Non-lethal  
 95% fid. limits : 0.0 - 0.0 %  
 Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890013

TEST CONC. %  
 ELAPSED TIME  
 00:10 48:10

100	pH 7.3 7.4 O2 ppm 7.8 8.7 Cond. 1040 1120 Temp(C) 20.0 20.0
50	pH 7.8 7.8 O2 ppm 7.8 8.6 Cond. 820 860 Temp(C) 20.0 20.0
26	pH 8.0 8.0 O2 ppm 7.8 8.7 Cond. 700 740 Temp(C) 20.0 20.0
13	pH 8.0 8.0 O2 ppm 7.8 8.7 Cond. 640 680 Temp(C) 20.0 20.0
6	pH 8.1 8.1 O2 ppm 8.0 8.7 Cond. 600 620 Temp(C) 20.0 20.0
Control	pH 8.0 8.1 O2 ppm 8.6 8.7 Cond. 540 600 Temp(C) 20.0 20.0

## MISA-PETROLEUM-DAPHNIA

## TOXICITY TEST REPORT

Sample: 05890024

## TEST CONDITIONS

Company : Suncor Inc.  
Sarnia, ONT  
(490102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : Process Effluent, (300)  
Laboratory : Pollutech  
Sampling Method : Grab  
Sampled By : Ferguson  
Date Collected : 01/06/89  
Received : 03/07/89  
Tested : 03/07/89 at: 1600

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, OME, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY	%
100	0	00:00 47:50	0	0
50	0		0	0
25	0		0	0
13	0		0	0
6	0		0	0
Control	0		0	0

48 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments :

SLOPE of Mortality Curve : none  
LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 05890024

TEST CONC.  
%  
ELAPSED TIME  
00:00 47:50

100	pH 02 ppm Cond. Temp(C)	7.0 9.2 1100 20.0	7.1 8.2 1220 20.0
50	pH 02 ppm Cond. Temp(C)	7.7 9.0 880 20.0	7.6 8.6 950 20.0
26	pH 02 ppm Cond. Temp(C)	7.8 9.0 760 20.0	7.8 8.9 800 20.0
13	pH 02 ppm Cond. Temp(C)	7.9 9.0 680 20.0	7.8 8.9 695 20.0
6	pH 02 ppm Cond. Temp(C)	7.9 9.0 620 20.0	7.9 9.0 640 20.0
Control	pH 02 ppm Cond. Temp(C)	8.0 9.4 580 20.0	8.0 9.4 610 20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 02890032

## TEST CONDITIONS

Company : Suncor Inc.  
 : 26016, ONT  
 : (490102)  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (300)  
 Laboratory : MOE  
 Sampling Method : grab  
 Sampled By : D. Hamilton  
 Date Collected : 03/29/89  
 Received : 03/30/89  
 Tested : 03/30/89 at: 1536

Type of Bioassay : STATIC  
 : (Daphnia magna Acute Lethality Toxicity  
 : Test Protocol. ONE, 1988)

Test Animal :  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
		00:00 24:00 48:00	%
100	0	0	0
60	0	0	0
30	0	0	0
15	0	0	0
5	0	0	0
Control	0	1 1	8

48 Hour LC50 : Non-Lethal  
 95% fid. limits : 0.0 - 0.0 %  
 Comments : MISA Audit

## TOXICITY TEST PARAMETERS

Sample Number: 02890032

TEST CONC.  
 %

ELAPSED TIME

00:00 24:00 48:00

100	pH 7.5 02 ppm 8.9 Cond. 1091 Temp(C) 20.0	7.5 7.5 1082 20.0
60	pH 7.8 02 ppm 9.0 Cond. 781 Temp(C) 20.0	7.9 7.7 775 20.0
30	pH 8.0 02 ppm 8.9 Cond. 560 Temp(C) 20.0	8.0 8.1 558 20.0
15	pH 8.0 02 ppm 8.8 Cond. 443 Temp(C) 20.0	8.1 8.2 439 20.0
5	pH 8.1 02 ppm 8.8 Cond. 368 Temp(C) 20.0	8.2 8.3 365 20.0
Control	pH 8.1 02 ppm 9.0 Cond. 337 Temp(C) 20.0	8.2 8.5 330 20.0

## MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05890029

## TEST CONDITIONS

Company : Suncor Inc.  
 : Sarnia, ONT  
 : (490102)  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (300)  
 Laboratory : Polutech  
 Sampling Method : Grab  
 Sampled By : C Ferguson  
 Date Collected : 04/03/89  
 Date Received : 04/03/89  
 Tested : 04/04/89 at: 1500

Type of Bioassay : STATIC  
 : (Daphnia magna Acute Lethality Toxicity  
 Test Protocol, OME, 1988)

Test Animal : D. magna  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY %
100	0	00:00 48:30	0
50	0		0
26	0		0
13	0		0
6	0		0
Control	0		0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve : none  
 LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 05890029

TEST CONC. %  
 ELAPSED TIME  
 00:00 48:30

100	pH 02 ppm Cond. Temp(C)	7.4 8.8 980 20.0	7.6 9.2 1080 20.0
50	pH 02 ppm Cond. Temp(C)	7.7 8.8 780 20.0	7.8 9.2 800 20.0
26	pH 02 ppm Cond. Temp(C)	7.8 8.8 660 20.0	7.8 9.3 700 20.0
13	pH 02 ppm Cond. Temp(C)	7.9 8.8 600 20.0	7.9 9.2 610 20.0
6	pH 02 ppm Cond. Temp(C)	7.9 8.8 540 20.0	7.9 9.2 580 20.0
Control	pH 02 ppm Cond. Temp(C)	8.0 9.2 520 20.0	7.9 9.1 550 20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
 LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890034

## TEST CONDITIONS

Company : Suncor Inc.  
 Region : Sarnia, ONT  
 Industry : (460102)  
 : Southwest  
 : Petroleum Refining  
 Control point : Process Effluent, (300)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : C. Ferguson  
 Date Collected : 05/01/89  
 Received : 05/01/89  
 Tested : 05/03/89 at: 1010

## Type of Bioassay

: STATIC  
 (Daphnia magna Acute Lethality Toxicity  
 Test Protocol. ONE, 1988)

## Test Animal

Weight(gm) :  
 Length(mm) :  
 : D. magna

## MORTALITY DATA

TEST CONC.	ELAPSED TIME	TOTAL MORTALITY
%	00:00 48:10	%
100	0	0
50	0	0
26	0	0
13	0	0
6	0	0
Control	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890034

TEST CONC.  
 % ELAPSED TIME  
 00:00 48:10

100	pH 7.3 O2 ppm 9.2 Cond. 1120 Temp(C) 1250 20.0 20.0	7.3 7.3 8.2 8.2 1250 1250 20.0 20.0
50	pH 7.9 O2 ppm 9.6 Cond. 820 Temp(C) 900 20.0 20.0	7.9 7.7 8.4 8.4 900 900 20.0 20.0
26	pH 8.0 O2 ppm 9.8 Cond. 640 Temp(C) 700 20.0 20.0	8.0 7.9 8.5 8.5 700 700 20.0 20.0
13	pH 8.0 O2 ppm 9.6 Cond. 520 Temp(C) 600 20.0 20.0	8.0 8.0 8.4 8.4 600 600 20.0 20.0
6	pH 8.1 O2 ppm 9.6 Cond. 360 Temp(C) 550 20.0 20.0	8.1 8.0 8.9 8.9 550 550 20.0 20.0
Control	pH 8.0 O2 ppm 9.8 Cond. 490 Temp(C) 510 20.0 20.0	8.0 8.0 9.2 9.2 510 510 20.0 20.0

## MISA-PETROLEUM-DAPHNIA

TOXICITY TEST REPORT Sample: 05880005

## TEST CONDITIONS

Company : Suncor Inc.  
 Location : 400105, ONT  
 Region : Southwest  
 Industry : Petroleum Refining  
 Control point : cooling water, (400)  
 Laboratory : Pollutech  
 Sampling Method : Grab  
 Sampled By : T. Moran  
 Date Collected : 12/12/88  
 Date Received : 12/12/88  
 Tested : 12/14/88 at: 1030  
 Type of Bioassay : STATIC  
 (Daphnia magna Acute Lethality Toxicity  
 Test Protocol - ONE, 1988)  
 Test Animal : D. magna  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY %
100	0	0	0
50	0	0	0
26	0	1	8
13	0	0	0
6	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

SLOPE of Mortality Curve :  
LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 05880005

TEST CONC. %

ELAPSED TIME

00:00 48:10

100	pH	7.9	7.9
	O2 ppm	10.2	9.6
	Cond.	300	370
	Temp(C)	20.0	20.0
50	pH	8.0	8.0
	O2 ppm	9.8	9.6
	Cond.	460	472
	Temp(C)	20.0	20.0
26	pH	8.2	8.1
	O2 ppm	9.6	9.6
	Cond.	500	520
	Temp(C)	20.0	20.0
13	pH	8.2	8.1
	O2 ppm	9.6	9.4
	Cond.	520	560
	Temp(C)	20.0	20.0
6	pH	8.2	8.1
	O2 ppm	9.6	9.4
	Cond.	520	560
	Temp(C)	20.0	20.0
Control	pH	8.2	8.1
	O2 ppm	9.6	9.4
	Cond.	560	600
	Temp(C)	20.0	20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 05890025

TEST CONDITIONS

Company : Suncor Inc.  
 : Sarnia, ONT  
 : (490102)  
Region : Southwest  
Industry : Petroleum Refining  
Control point : cooling water, (400)  
Laboratory : Pollutech  
 : Grab  
Sampling Method : C. Ferguson  
Sampled By : 03/06/89  
Date Collected : 03/06/89  
Received : 03/07/89 at: 1630  
Tested

Type of Bioassay : STATIC  
 : (Daphnia magna Acute Lethality Toxicity  
 : Test Protocol, OME, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY	%
100	0	00:00 48:10	0	0
50	0		0	0
20	0		0	0
13	0		0	0
6	0		0	0
Control	0		0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 05890025

TEST CONC. %  
ELAPSED TIME  
00:00 48:10

100	pH 02 ppm Cond. Temp(C)	7.9 9.4 320 20.0	7.9 9.4 360 20.0
50	pH 02 ppm Cond. Temp(C)	8.0 10.0 480 20.0	7.9 9.2 435 20.0
26	pH 02 ppm Cond. Temp(C)	8.0 9.2 520 20.0	7.9 9.5 420 20.0
13	pH 02 ppm Cond. Temp(C)	8.0 9.0 540 20.0	8.0 9.4 600 20.0
6	pH 02 ppm Cond. Temp(C)	8.0 9.0 580 20.0	8.0 9.4 610 20.0
Control	pH 02 ppm Cond. Temp(C)	8.0 9.4 580 20.0	7.9 9.3 610 20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : none  
 LC50 Calculated By :

Sample: 02890033

## TOXICITY TEST REPORT

## TEST CONDITIONS

Company : Suncor Inc.  
 (490102)  
 Region : Sarnia, ONT  
 Industry : Southwest  
 : Petroleum Refining  
 Control point : cooling water, (400)  
 Laboratory : MOE  
 Sampling Method : grab  
 Sampled By : D. Hamilton  
 Date Collected : 03/29/89  
 Received : 03/30/89  
 Tested : 03/30/89 at: 1555

## Type of Bioassay

: STATIC  
 (Daphnia magna Acute Lethality Toxicity  
 Test Protocol, OME, 1988)

Test Animal  
 Weight(gm)  
 Length(mm)

: D. magna  
 :  
 :

## MORTALITY DATA

TEST CONC.	%	ELAPSED	TIME	TOTAL MORTALITY	%
100	0	2	2	16	16
60	0	0	0	0	0
30	0	0	0	0	0
15	0	1	1	8	8
5	0	0	0	0	0
Control	0	0	1	8	8

48 Hour LC50

: &gt;100%

95% fid. limits : 0.0 - 0.0 %

Comments

: MISA Audit

## TOXICITY TEST PARAMETERS

Sample Number: 02890033

TEST  
CONC.  
%

ELAPSED

TIME

00:00 24:00 48:00

100	pH	8.1	8.2
	O2 ppm	10.1	8.3
	Cond.	382	379
	Temp(C)	20.0	20.0
60	pH	8.1	8.2
	O2 ppm	8.9	8.3
	Cond.	360	351
	Temp(C)	20.0	20.0
30	pH	8.1	8.2
	O2 ppm	8.7	8.3
	Cond.	346	341
	Temp(C)	20.0	20.0
15	pH	8.2	8.3
	O2 ppm	9.7	8.2
	Cond.	338	340
	Temp(C)	20.0	20.0
5	pH	8.2	8.3
	O2 ppm	8.6	8.3
	Cond.	334	334
	Temp(C)	20.0	20.0
Control	pH	8.2	8.3
	O2 ppm	8.8	8.3
	Cond.	330	335
	Temp(C)	20.0	20.0

COMPANY: Texaco Canada Inc., Nanticoke  
(520205)  
(now with Nanticoke Refinery)  
SECTOR: Petroleum Refining  
REGION: West Central

#### SUMMARY

The data for six trout bioassays, conducted on process effluent samples collected between December 1988 and May 1989, were provided by Texaco Canada Incorporated. All six process effluent samples were determined to have been non-acutely lethal to test fish.

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#### Process Effluent

06881220 sampled: 12/12/88 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

06890126 sampled: 01/24/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

06890210 sampled: 02/06/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or sublethal impairment observed

06890308 sampled: 03/07/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or sublethal impairment observed

06890405 sampled: 04/04/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or sublethal impairment observed

06890529 sampled: 05/09/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or sublethal impairment observed

01890108 sampled: 05/31/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA audit sample.

storm water

Texaco Canada Inc. (continued)

landfarm leachate

EO-leachate-creek

SLOPE of Mortality Curve : Moving average  
 LC50 Calculated By :

Sample: 06881220

## TOXICITY TEST REPORT

## TEST CONDITIONS

Company : Texaco Canada Inc.  
 : Nanticoke, ONT  
 : (S20205)  
 Region : West Central  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (200)  
 Laboratory : Beek  
 Sampling Method : Intr. Comp  
 Sampled By : T. S. S.  
 Date Rec'd : 12/12/88  
 Date Tested : 12/14/88  
 Tested : 12/14/88 at: 1400

Type of Bioassay : STATIC  
 : (Protocol to determine the acute lethality  
 : of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E				TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00
100	0	0	0	0	0
50	0	0	0	0	0
30	0	0	0	0	0
20	0	0	0	0	0
10	0	0	0	0	0
Control	0	0	0	0	0

76 Hour LC50 : Non-lethal  
 95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 06881220

TEST  
CONC.  
%

E L A P S E D T I M E

00:00 24:00 48:00 72:00 96:00

100	pH 02 ppm Cond. Temp(C)	7.8 7.6 13.0 15.0	8.3 9.8 15.0	8.3 9.2 15.0	8.4 10.3 12.2 14.4
50	pH 02 ppm Cond. Temp(C)	7.8 8.2 8.2 15.0	8.3 9.2 9.9 15.0	8.3 9.8 8.30	8.3 9.8 8.30 15.0
30	pH 02 ppm Cond. Temp(C)	7.7 7.0 6.47 15.0	7.9 8.2 9.7 15.0	8.3 9.7 10.4 15.0	8.3 9.7 10.4 15.0
20	pH 02 ppm Cond. Temp(C)	7.7 7.5 5.48 15.0	8.2 6.9 9.2 15.0	8.2 8.9 8.9 15.0	8.2 9.6 550 15.0
10	pH 02 ppm Cond. Temp(C)	7.7 7.6 4.50 15.0	7.9 7.2 9.3 15.0	8.2 8.9 8.9 15.0	8.2 9.8 448 15.0
Control	pH 02 ppm Cond. Temp(C)	7.5 7.5 3.52 15.0	8.0 8.6 8.0 15.0	8.2 8.0 8.2 15.0	8.0 8.2 8.2 15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : moving average  
 LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 06890126

## TEST CONDITIONS

Company : Texaco Canada Inc.  
 : Nanticoke, ONT  
 : (520205)  
 Region : West Central  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (200)  
 Laboratory : Beek  
 Sampling Method : grab  
 Sampled By : Bob Bunellis  
 Date Collected : 01/24/89  
 Date Received : 01/25/89  
 Tested : 01/25/89 at: 1400

Type of Bioassay : STATIC  
 : (Protocol to determine the acute lethality  
 : of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00	%
100	0	0	0	0	0	0
50	0	0	0	0	0	0
50	0	0	0	0	0	0
20	0	0	0	0	0	0
10	0	0	0	0	0	0
Control	0	0	0	0	0	0

96 Hour LC50 : Non-Lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 06890126

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00
100	pH	8.3	8.5	8.6	8.5
	O2 ppm	8.6	8.2	9.5	9.2
	Temp(C)	30.4	15.0	15.0	15.0
50	pH	8.2	8.4	8.4	8.3
	O2 ppm	9.6	8.0	8.9	8.6
	Temp(C)	17.62	15.0	15.0	15.0
30	pH	8.0	8.1	8.4	8.2
	O2 ppm	9.2	8.9	9.5	9.7
	Temp(C)	12.69	15.0	15.0	15.0
20	pH	8.0	8.3	8.3	8.3
	O2 ppm	8.2	8.0	8.8	8.9
	Temp(C)	9.92	15.0	15.0	15.0
10	pH	7.8	8.2	8.2	8.3
	O2 ppm	9.0	8.8	9.2	9.0
	Temp(C)	7.10	15.0	15.0	15.0
Control	pH	7.7	8.0	8.1	8.1
	O2 ppm	8.6	9.2	9.0	9.1
	Temp(C)	9.97	15.0	15.0	15.0

## TOXICITY TEST REPORT Sample: 06890210

## TEST CONDITIONS

Company : Texaco Canada Inc.  
Nanticoke, ONT  
(520205)  
Region : West Central  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)

Laboratory : Beak  
Sampling Method : Fish  
Sample Collected By : R. Bunnell  
Date Collected : 02/06/89  
Received : 02/07/89  
Tested : 02/07/89 at: 1600

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. OME, 1983).

Test Animal : Rainbow trout  
Weight(gm) :  
Length(cm) :

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME				TOTAL MORTALITY	%
		00:00	24:00	48:00	72:00	96:00	
100	0	0	0	0	0	0	0
50	0	0	0	0	0	0	0
30	0	0	0	0	0	0	0
20	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0
Control	0	0	0	0	0	0	0

% Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

## TOXICITY TEST PARAMETERS

Sample Number: 06890210

TEST  
CONC.  
%

ELAPSED TIME

00:00 24:00 48:00 72:00 96:00

100	pH 02 ppm Cond. Temp (C)	7.7 10.2 1990 13.0	8.1 9.3 14.0	8.1 9.3 14.0	8.1 9.6 15.0 16.0
50	pH 02 ppm Cond. Temp (C)	7.7 9.9 1230 14.0	8.2 10.4 10.4 14.0	8.2 10.4 10.1 15.0	8.3 10.2 1368 16.0
30	pH 02 ppm Cond. Temp (C)	7.6 9.8 876 14.0	8.1 10.4 10.4 14.0	8.1 9.9 9.9 15.0	8.2 10.1 983 16.0
20	pH 02 ppm Cond. Temp (C)	7.6 9.8 718 15.0	8.0 10.0 9.4 14.0	8.1 9.4 9.2 15.0	8.1 9.3 809 16.0
10	pH 02 ppm Cond. Temp (C)	7.5 9.8 554 15.0	7.9 9.6 9.6 14.0	8.0 9.6 9.4 15.0	8.1 9.4 629 16.0
Control	pH 02 ppm Cond. Temp (C)	7.4 9.8 382 15.0	7.8 10.0 10.2 14.0	7.9 10.2 9.8 15.0	8.0 9.7 398 16.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve : moving average  
LC50 Calculated By :

## TOXICITY TEST REPORT Sample: 06890308

## TEST CONDITIONS

Company : Texaco Canada Inc.  
Natick, ONT  
(520205)  
Region : West Central  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : Beak  
Sampling Method : grab  
Sampled By : Rob Bunellis  
Date Collected : 03/07/89  
Received : 03/08/89  
Tested : 03/08/89 at: 1500

## Type of Bioassay

: STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. OIE, 1983).

Test Animal  
Weight(gm)  
Length(mm)

: Rainbow trout  
:  
:

## MORTALITY DATA

TEST CONC.	ELAPSED TIME				TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00
100	0	0	0	0	0
50	0	0	0	0	0
30	0	0	0	0	0
20	0	0	0	0	0
10	0	0	0	0	0
Control	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

## TOXICITY TEST PARAMETERS

Sample Number: 06890308

TEST CONC. %	ELAPSED TIME					
	00:00	24:00	48:00	72:00	96:00	
100	pH	8.0	7.9	8.0	7.9	7.9
	O2 ppm	11.0	9.8	10.0	8.7	9.0
	Cond.	2200				2100
	Temp(C)	15.0	14.0	15.0	15.0	15.0
50	pH	8.0	8.0	8.0	7.9	7.9
	O2 ppm	10.2	10.2	10.4	9.0	8.6
	Cond.	1269				1296
	Temp(C)	15.0	14.0	15.0	15.0	15.0
30	pH	8.1	8.0	8.0	7.9	7.9
	O2 ppm	10.4	10.4	10.3	9.3	9.5
	Cond.	923				930
	Temp(C)	15.0	14.0	15.0	15.0	15.0
20	pH	8.0	8.0	7.9	7.7	7.7
	O2 ppm	10.2	10.2	10.4	8.3	8.3
	Cond.	739				742
	Temp(C)	15.0	14.0	15.0	15.0	15.0
10	pH	7.8	8.0	7.8	7.6	7.7
	O2 ppm	10.0	10.0	9.5	8.0	8.6
	Cond.	573				565
	Temp(C)	15.0	14.0	15.0	15.0	15.0
Control	pH	7.4	7.9	7.8	7.3	7.5
	O2 ppm	9.4	9.8	9.8	7.8	7.8
	Cond.	438				378
	Temp(C)	15.0	14.0	15.0	15.0	15.0

## WISA-PETROLEUM-FISH

SLOPE of Mortality Curve :  
 LC50 Calculated By : moving average

Sample: 06890405

## TOXICITY TEST REPORT

## TEST CONDITIONS

Company : Texaco Canada Inc.  
 Address : 12000 Highway 63, OMT  
 Region : West Central  
 Industry : Petroleum Refining  
 Control Point : Process Effluent, (200)  
 Laboratory : Beak  
 Sampling Method : Grab  
 Sampled By : Rob Bunellis  
 Date Collected : 04/04/89  
 Received : 04/05/89  
 Tested : 04/05/89 at: 1400  
 Type of Bioassay : STATIC  
 (Protocol to determine the acute lethality  
 of liquid effluents to fish, OME, 1983).  
 Test Animal : Rainbow trout  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	E L A P S E D T I M E					TOTAL MORTALITY %
	00:00	24:00	48:00	72:00	96:00	
100	0	0	0	0	0	0
Control	0	0	0	0	0	0
Control	0	0	0	0	0	0

% Hour LC50 : Non-lethal  
 95% fid. limits : 0.0 - 0.0 %  
 Comments : no mortality or sublethal impairment observed

## TOXICITY TEST PARAMETERS

Sample Number: 06890405

TEST CONC. %	E L A P S E D T I M E				
	00:00	24:00	48:00	72:00	96:00
100	pH	8.1	8.2	8.6	8.4
	O2 ppm	9.2	8.3	8.6	9.0
	Temp(C)	1983	15.0	15.0	14.0
100	pH	8.2	8.5	8.7	8.6
	O2 ppm	9.3	9.4	9.8	9.9
	Temp(C)	2070	15.0	15.0	14.0
Control	pH	8.1	8.5	8.6	8.6
	O2 ppm	9.3	9.4	9.3	9.0
	Temp(C)	361	15.0	15.0	14.0
Control	pH	8.1	8.5	8.5	8.6
	O2 ppm	9.3	9.2	9.1	9.1
	Temp(C)	363	15.0	15.0	14.0

## MISA-PETROLEUM-FISH

TOXICITY TEST REPORT Sample: 06890529

## TEST CONDITIONS

Company : Texaco Canada Inc.  
 (S20205)  
 Region : West Central  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (200)  
 Laboratory : Beak  
 Sampling Method : grab  
 Sampled By : Rob Bunellis  
 Date Collected : 05/09/89  
 Received : 05/10/89  
 Tested : 05/10/89 at: 1500

## Type of Bioassay

: STATIC  
 (Protocol to determine the acute lethality  
 of liquid effluents to fish. OME, 1983).

## Test Animal

Weight(gm)  
 Length(mm)  
 : Rainbow trout  
 :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME				TOTAL MORTALITY
%	00:00	24:00	48:00	72:00	96:00
100	0	0	0	0	0
65	0	0	0	0	0
50	0	0	0	0	0
30	0	0	0	0	0
20	0	0	0	0	0
10	0	0	0	0	0
Control	0	0	0	0	0

96 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or sublethal impairment observed

SLOPE of Mortality Curve :  
 LC50 Calculated By : moving average

## TOXICITY TEST PARAMETERS

Sample Numbers: 06890529

## TEST ELAPSED TIME

TEST CONC. %

00:00 24:00 48:00 72:00 96:00

100	pH	8.3	8.1	8.2	8.2	8.1
	O2 ppm	6.5	8.8	8.5	8.3	9.3
	Cond.	1239	1218	1572	1580	1574
65	Temp(C)	14.0	15.0	15.0	15.0	15.0
	pH	8.3	8.2	8.1	8.1	8.0
	O2 ppm	8.1	8.3	8.4	7.5	9.0
50	Cond.	1168	1078	1151	1158	1155
	Temp(C)	14.0	15.0	15.0	15.0	15.0
30	pH	8.2	8.1	8.0	8.1	8.0
	O2 ppm	7.2	7.5	8.2	8.2	8.0
	Cond.	762	748	973	764	780
20	Temp(C)	14.0	15.0	15.0	15.0	15.0
	pH	8.1	8.1	8.0	8.1	8.0
	O2 ppm	8.1	7.5	8.0	8.7	8.6
10	Cond.	650	658	625	563	635
	Temp(C)	14.0	15.0	15.0	15.0	15.0
Control	pH	8.2	8.2	8.1	8.0	8.0
	O2 ppm	8.5	7.2	8.5	8.2	8.4
	Cond.	584	554	581	559	598
Control	Temp(C)	14.0	15.0	15.0	15.0	15.0
	pH	8.1	8.2	8.1	7.9	8.0
	O2 ppm	8.6	8.8	9.0	8.5	8.6
Control	Cond.	472	468	479	499	499
	Temp(C)	14.0	15.0	15.0	15.0	15.0
Control	pH	8.0	8.1	8.1	7.7	7.9
	O2 ppm	8.1	8.2	8.0	7.7	8.5
	Cond.	348	347	354	358	362
Control	Temp(C)	14.0	15.0	15.0	15.0	15.0

## MISA-PETROLEUM-FISH

SLOPE of Mortality Curve :  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 01890108

## TOXICITY TEST PARAMETERS

## TEST CONDITIONS

Company : Texaco Canada Inc.  
Nanticoke, ONT  
(520205)  
Region : West Central  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : MOE  
Sampling Method : grab  
Sampled By : G. Perkins  
Date Collected : 05/31/89  
Received : 05/31/89  
Tested : 05/31/89 at: 1100

Type of Bioassay : STATIC  
(Protocol to determine the acute lethality  
of liquid effluents to fish. ONE, 1983).

Test animals:  
Weight(gm)  
Length(cm)  
Rainbow trout

## MORTALITY DATA

TEST CONC.	%	00:00	03:00	23:45	46:00	73:45	96:30	TOTAL MORTALITY	%
100	0	0	0	0	0	0	0	0	0
65	0	0	0	0	0	0	0	0	0
40	0	0	0	0	0	0	0	0	0
30	0	0	0	0	0	0	1	10	10
20	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	1	10	10
Control	0	0	0	0	0	0	0	0	0

96 hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments : MISA audit sample.

Sample Number: 01890108

TEST CONC. %  
ELAPSED TIME  
00:00 03:00 23:45 46:00 73:45 96:30

100	pH	7.5	8.0	8.1	8.2	8.3	7.3
	O2 ppm	8.7	9.6	9.7	9.7	9.5	9.1
	Cond.	1800	1800	1590	1550	1550	1500
	Temp(C)	15.0	15.0	15.0	15.0	15.0	15.0
65	pH	7.9	8.0	8.1	8.2	7.4	
	O2 ppm	9.3	9.7	9.7	9.4	9.2	
	Cond.	1180	1120	1120	1120	1100	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	
40	pH	7.9	7.9	7.9	8.0	7.4	
	O2 ppm	9.5	9.6	9.7	9.4	9.2	
	Cond.	800	800	800	800	800	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	
30	pH	7.7	7.8	7.9	8.0	7.4	
	O2 ppm	9.4	9.7	9.8	9.5	9.3	
	Cond.	680	660	660	660	680	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	
20	pH	7.8	7.8	7.9	8.0	7.4	
	O2 ppm	9.6	9.7	9.7	9.7	9.5	
	Cond.	540	500	520	520	550	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	
10	pH	7.5	7.6	7.7	7.9	7.4	
	O2 ppm	9.5	9.7	9.8	9.7	9.3	
	Cond.	390	380	385	380	390	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	
Control	pH	7.0	7.4	7.6	7.5	7.4	
	O2 ppm	9.6	9.6	9.8	9.7	9.3	
	Cond.	260	260	260	260	260	
	Temp(C)	15.0	15.0	15.0	15.0	15.0	



COMPANY: Texaco Canada Inc., Nanticoke  
(520205)  
(now with Nanticoke Refinery)  
SECTOR: Petroleum Refining  
REGION: West Central

#### SUMMARY

Data for six *Daphnia magna* acute lethality toxicity tests conducted on samples of Process Effluent collected between December 1988 and May 1989 were submitted by Texaco Canada Inc. in Nanticoke. All six samples were not acutely lethal to *Daphnia magna*.

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#### Process Effluent

06881225 sampled: 12/12/88 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

06890127 sampled: 01/24/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments:

06890211 sampled: 02/06/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no immobilty observed during testing

06890309 sampled: 03/07/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or immobility observed in 48 Hrs

06890406 sampled: 04/04/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or immobility observed in 48 Hrs

06890530 sampled: 05/09/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: no mortality or immobility observed

02890108 sampled: 05/31/89 non-lethal  
95% fid. limits: 0.0 - 0.0 %  
comments: MISA Audit

storm water

Texaco Canada Inc. (continued)

landfarm leachate

EO-leachate-creek

SLOPE of Mortality Curve :  
LC50 Calculated By :

Sample: 06881225

## TOXICITY TEST REPORT

## TEST CONDITIONS

Company : Texaco Canada Inc.  
Address : 6500 Steeles Ave. E., Unit 100  
Region : East Central  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : BEAK  
Sampling Method : 24hr. Comp  
Sampled By : Texaco  
Date Collected : 12/12/88  
Received : 12/12/88  
Tested : 12/14/88 at: 1100

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, OME, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	24:00 48:00	%
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 06881225

TEST ELAPSED TIME  
CONC. % 00:00 24:00 48:00

100	pH 7.8 O2 ppm 7.0 Cond. 1308 Temp(C) 20.0	20.0	20.0	48:00	8.1 1285 20.0
50	pH 8.0 O2 ppm 7.0 Cond. 826 Temp(C) 20.0	20.0	20.0	20.0	8.1 6.3 815
30	pH 8.0 O2 ppm 7.1 Cond. 653 Temp(C) 20.0	20.0	20.0	20.0	8.1 6.5 648
20	pH 8.0 O2 ppm 7.2 Cond. 534 Temp(C) 20.0	20.0	20.0	20.0	8.1 5.7 550
10	pH 8.0 O2 ppm 6.1 Cond. 435 Temp(C) 20.0	20.0	20.0	20.0	8.0 5.7 362
Control	pH 8.2 O2 ppm 6.9 Cond. 339 Temp(C) 20.0	20.0	20.0	20.0	7.6 6.5 335

# MTSA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : moving average  
LC50 Calculated By :

TOXICITY TEST REPORT Sample: 06890127

## TEST CONDITIONS

Company : Texaco Canada Inc.  
Nanticoke, ONI  
(520205)  
Region : West Central  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : Beak  
Sampling Method : Bob  
Sampled By : Bob Bumelis  
Date Collected : 01/24/89  
Received : 01/25/89  
Tested : 01/25/89 at: 1600

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol. OHE, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
		00:00 24:00 48:00	%
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments :

## TOXICITY TEST PARAMETERS

Sample Number: 06890127

TEST CONC. %  
ELAPSED TIME  
00:00 24:00 48:00

100	pH 8.2 O2 ppm 8.6 Cond. 3190 Temp(C) 21.0	8.2 8.6 3190 21.0	8.6 8.6 3240 20.0
50	pH 8.2 O2 ppm 8.6 Cond. 1855 Temp(C) 21.0	8.2 8.6 1855 21.0	8.5 8.5 1757 20.0
30	pH 8.2 O2 ppm 8.7 Cond. 1211 Temp(C) 21.0	8.2 8.7 1211 21.0	8.4 8.9 1181 20.0
20	pH 8.3 O2 ppm 8.6 Cond. 1041 Temp(C) 21.0	8.3 8.6 1041 21.0	8.3 8.5 963 20.0
10	pH 8.2 O2 ppm 8.6 Cond. 682 Temp(C) 21.0	8.2 8.6 682 21.0	8.2 8.8 663 20.0
Control	pH 8.1 O2 ppm 8.4 Cond. 405 Temp(C) 21.0	8.1 8.4 405 21.0	7.9 8.7 405 20.0

## TOXICITY TEST REPORT Sample: 06890211

## TEST CONDITIONS

Company : Texaco Canada Inc.  
Nanticoke, ONT  
(520205)  
Region : West Central  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : Beek  
Sampling Method : grab  
Sampled By : D. Duggan  
Date Collected : 02/05/89  
Received : 02/07/89  
Tested : 02/07/89 at: 1410  
Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, OME, 1988)  
: D. magna  
: :  
: :

Test Animal  
Weight(gm)  
Length(mm)

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
100	0	0 0 0	0
50	0	0 0 0	0
30	0	0 0 0	0
20	0	0 0 0	0
10	0	0 0 0	0
Control	0	0 0 0	0

48 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments : no immobility observed during testing

## TOXICITY TEST PARAMETERS

Sample Number: 06890211

TEST  
CONC.  
%

ELAPSED  
TIME  
00:00 24:00 48:00

100	pH 8.2 02 ppm 8.6 Cond. 1842 Temp(C) 20.0 20.0 20.0	7.8 8.8 1831 20.0 20.0 20.0	8.2 8.6 1842 20.0 20.0 20.0
50	pH 8.1 02 ppm 8.5 Cond. 1129 Temp(C) 20.0 20.0 20.0	8.0 8.7 1129 20.0 20.0 20.0	8.1 8.5 1140 20.0 20.0 20.0
30	pH 8.1 02 ppm 8.4 Cond. 814 Temp(C) 20.0 20.0 20.0	8.1 8.5 814 20.0 20.0 20.0	8.1 8.4 854 20.0 20.0 20.0
20	pH 8.1 02 ppm 8.6 Cond. 666 Temp(C) 20.0 20.0 20.0	8.1 8.6 666 20.0 20.0 20.0	8.1 8.4 679 20.0 20.0 20.0
10	pH 8.1 02 ppm 8.2 Cond. 536 Temp(C) 20.0 20.0 20.0	8.1 8.2 536 20.0 20.0 20.0	8.2 8.3 540 20.0 20.0 20.0
Control	pH 8.0 02 ppm 8.6 Cond. 328 Temp(C) 20.0 20.0 20.0	8.0 8.6 328 20.0 20.0 20.0	8.0 8.4 335 20.0 20.0 20.0

## MISA-PETROLEUM-DAPHNIA

## TOXICITY TEST REPORT Sample: 06890309

## TEST CONDITIONS

Company : Texaco Canada Inc.  
Nanticoke, ONT  
(520205)  
Region : West Central  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : Beak  
Sampling Method : grab  
Sampled By : Rob Bunellis  
Date Collected : 03/08/89  
Received : 03/08/89  
Tested : 03/08/89 at: 1620

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, OME, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY
		00:00 24:00 48:00	%
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed in 48 Hrs

SLOPE of Mortality Curve : moving average  
LC50 Calculated By :

## TOXICITY TEST PARAMETERS

Sample Number: 06890309

TEST CONC. %  
ELAPSED TIME  
00:00 24:00 48:00

100	pH 02 ppm Cond. Temp(C)	7.8 9.1 1974 20.0	7.6 8.0 1990 20.0
50	pH 02 ppm Cond. Temp(C)	7.8 9.0 1152 20.0	7.8 8.1 1155 20.0
30	pH 02 ppm Cond. Temp(C)	7.8 8.6 819 20.0	7.8 7.0 824 20.0
20	pH 02 ppm Cond. Temp(C)	7.8 8.5 645 20.0	7.9 7.0 652 20.0
10	pH 02 ppm Cond. Temp(C)	7.8 8.7 510 20.0	8.0 7.4 511 20.0
Control	pH 02 ppm Cond. Temp(C)	7.7 9.0 361 20.0	8.0 7.6 365 20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve : moving average  
LC50 Calculated By :

Sample: 06890406

## TOXICITY TEST REPORT

## TEST CONDITIONS

Company : Texaco Canada Inc.  
 : Nanticoke, ONT  
 : (520205)  
 Region : West Central  
 Industry : Petroleum Refining  
 Control point : Process Effluent, (200)  
 Laboratory : Beak  
 Sampling Method : grab  
 Sampled By : Rob Bunellis  
 Date Collected : 04/04/89  
 Date received : 04/05/89  
 Tested : 04/05/89 at: 1330

Type of Bioassay : SIATIC  
 (Daphnia magna Acute Lethality Toxicity  
 test Protocol, OME, 1988)

Test Animal : D. magna  
 Weight(gm) :  
 Length(mm) :

## MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	24:00 48:00	%
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed in 48 Hrs

## TOXICITY TEST PARAMETERS

Sample Number: 06890406

TEST CONC.  
 %

ELAPSED TIME  
 00:00 24:00 48:00

100	pH 8.0	02 ppm 9.4	Cond. 2220	Temp(C) 20.0	8.1 8.2 2220 20.0
50	pH 8.2	02 ppm 9.2	Cond. 1398	Temp(C) 20.0	8.2 8.4 1299 20.0
30	pH 8.3	02 ppm 9.1	Cond. 946	Temp(C) 20.0	8.2 8.4 957 20.0
20	pH 8.4	02 ppm 9.1	Cond. 761	Temp(C) 20.0	8.2 8.7 771 20.0
10	pH 8.5	02 ppm 9.4	Cond. 568	Temp(C) 20.0	8.2 8.8 576 20.0
Control	pH 8.5	02 ppm 9.3	Cond. 388	Temp(C) 20.0	8.2 8.6 393 20.0

## MISA-PETROLEUM-DAPHNIA

SLOPE of Mortality Curve :  
LC50 Calculated By : moving average

Sample: 06890530

## TOXICITY TEST REPORT

## TEST CONDITIONS

Company : Texaco Canada Inc.  
Nanticoke, ONT  
(520205)  
Region : West Central  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : Beak  
Sampling Method : grab  
Sampled By : Rob Bumellis  
Date Collected : 05/09/89  
Received : 05/10/89  
Tested : 05/10/89 at: 1530

## Type of Bioassay

: STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol, OHE, 1988)

Test Animal  
Weight(gm)  
Length(mm)

: D. magna  
:  
:

## MORTALITY DATA

TEST CONC.	ELAPSED TIME		TOTAL MORTALITY
%	00:00	24:00	48:00
100	0	0	0
50	0	0	0
30	0	0	0
20	0	0	0
10	0	0	0
Control	0	0	0

48 Hour LC50 : Non-lethal

95% fid. limits : 0.0 - 0.0 %

Comments : no mortality or immobility observed

## TOXICITY TEST PARAMETERS

Sample Number: 06890530

TEST CONC. %  
ELAPSED TIME  
00:00 24:00 48:00

100	pH 02 ppm Cond. Temp(C)	7.8 8.9 1484 21.0	8.1 8.2 1667 21.0
50	pH 02 ppm Cond. Temp(C)	8.0 8.4 903 21.0	8.1 8.1 902 21.0
30	pH 02 ppm Cond. Temp(C)	8.1 8.5 667 21.0	8.2 8.1 663 21.0
20	pH 02 ppm Cond. Temp(C)	8.2 8.5 554 21.0	8.2 8.0 568 21.0
10	pH 02 ppm Cond. Temp(C)	8.2 8.4 439 21.0	8.2 8.2 442 21.0
Control	pH 02 ppm Cond. Temp(C)	7.3 8.3 327 21.0	8.1 8.2 323 21.0

Sample: 02890108

TOXICITY TEST REPORT

## TEST CONDITIONS

Company : Texaco Canada Inc.  
(520205)  
Region : West Central  
Industry : Petroleum Refining  
Control point : Process Effluent, (200)  
Laboratory : MCE  
Sampling Method : grab  
Sampled By : I. G. Perkins  
Date Collected : 05/31/89  
Received : 05/31/89  
Tested : 05/31/89 at: 1210

Type of Bioassay : STATIC  
(Daphnia magna Acute Lethality Toxicity  
Test Protocol. ONE, 1988)

Test Animal : D. magna  
Weight(gm) :  
Length(mm) :

## MORTALITY DATA

TEST CONC.	%	ELAPSED TIME	TOTAL MORTALITY	%
100	0	0 0 0 0	0	0
60	0	0 0 0 0	0	0
30	0	0 0 0 0	0	0
15	0	0 0 0 0	0	0
5	0	0 0 0 0	0	0
Control	0	0 0 0 0	0	0

48 Hour LC50 : Non-lethal  
95% fid. limits : 0.0 - 0.0 %  
Comments : MISA Audit

TOXICITY TEST PARAMETERS

Sample Number: 02890108

TEST CONC.	%	ELAPSED TIME
100	8.0 9.3 1177	8.4 8.4 1159
60	8.1 9.4 816	8.3 8.5 798
30	8.1 9.6 562	8.4 8.6 568
15	8.2 9.6 442	8.3 8.6 440
5	8.2 9.6 351	8.3 8.4 350
Control	8.2 9.7 311	8.2 8.4 345

TEST CONC.	%	ELAPSED TIME
100	8.0 9.3 1177	8.4 8.4 1159
60	8.1 9.4 816	8.3 8.5 798
30	8.1 9.6 562	8.4 8.6 568
15	8.2 9.6 442	8.3 8.6 440
5	8.2 9.6 351	8.3 8.4 350
Control	8.2 9.7 311	8.2 8.4 345





